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Revision of the genus *Cloesia* Hampson, 1900: description of five new species and recombination of two species (Noctuoidea Erebidae Arctiinae Lithosiini)

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Lithosiini;
Cloesia;
Dipaenae;
barcode COI gene;
new species;
new combination.

Abstract. – The genus *Cloesia* Hampson, 1900 which contained, up to now, three different species is reviewed. Besides the historical species which are redescribed, two more species wrongly classified are transferred to the genus: *Dipaenae zygaenoides* Toulgoët, 1983 and *Lithoprocris methyalea* Hampson, 1900. Then three new species from Latin America are added: *Cloesia aereus* Laguerre **sp. n.** from S.E. Brazil, *Cloesia andensis* Laguerre **sp. n.** from Peru and Bolivia and *Cloesia imitator* Laguerre **sp. n.** from French Guiana. Finally, two more species are described from Central America: *Cloesia mariamartachavarriae* Espinoza **sp. n.** and *Cloesia luzmariaromeroae* Espinoza **sp. n.** both from Costa Rica. All species, their male genitalia and the majority of female genitalia are illustrated. A distance tree of COI gene sequences is presented and discussed.

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Introduction

The genus *Cloesia* was created by Sir George F. Hampson in 1900 to accommodate *Ichoria parthia* described by Druce in 1889 from Bugaba in Panama. In 1911, William Schaus described one more species: *Cloesia digna* Schaus, 1911 from Sixola in Costa Rica and the same year Paul Dognin described a third species, *Cloesia normalis* Dognin, 1911 from Alto de las Cruces, Cali, Colombia. Since these two publications nothing has been added to the genus *Cloesia*. An intensive study of the Neotropical Lithosiini by the way of the so-called barcode technique has revealed that the situation is much more complex than previously thought. In South America at least three new species were found, in Central America two more new species were also found and finally two species were found to be wrongly classified and are here transferred into the genus *Cloesia*.

Materials and Methods

Adult genitalia were prepared by boiling abdomens during 15 minutes with 1 pellet of potash in 4 ml of water. After being washed with water and then alcohol, genitalia were photographed in natural position suspended in 95% alcohol, then types and museum specimens were mounted in Euparal, and remaining specimens were simply stored in glycerol. Photos were taken with a CoolPix 4500 Nikon camera attached to a trinocular Nikon stereomicroscope SMZ-10A. For genitalia pictures resolution was enhanced using focal planes fusion technique (5 to 9 planes were used generally) by the way of the free software CombineZM (HADLEY, 2009).

We had the opportunity to use analysis of short sequences of DNA corresponding to the COI mitochondrial gene. This gene is now routinely used for specific discrimination and identification (HEBERT *et al.* 2003). The use of these sequences is currently known as "DNA barcoding". A project concerning Neotropical Arctiinae has been initiated within the framework of "ALL-LEPS BARCODE OF LIFE" (website http://www.lepbarcoding.org) which objective is to archive the DNA barcodes of all known Lepidoptera. DNA was extracted, amplified and sequenced at the "Canadian Centre for DNA Barcoding" (CCDB) in Guelph, Ontario, starting from dry legs removed from specimens coming from author's collection. Details of various protocols have been described in VAGLIA *et al.*, (2008) and Decaëns & Rougerie (2008). These can be found on the website of CCDB (http:// http://www.ccdb.ca/resources.php). In some cases, we provided also the BIN reference number which is a unique taxonomic unit that

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closely corresponds to a species. In a recent study of 1541 species of Canadian Noctuoidea, Zahiri *et al.* (2014) were able to affirm that BINs (Ratnasigham & Hebert, 2013) are a strong proxy for species, providing a pathway for a rapid, accurate estimation of animal diversity. Any people can use this BIN number to retrieve all data linked to this taxonomic unit, for instance by entering it on the web site:
http://www.boldsystems.org/index.php/Public_BarcodeIndexNumber_Home.

The sequences were aligned and downloaded from BOLD and analyzed using MEGA7 (Kumar *et al.* 2016) for a cladistic analysis. Bootstrap values (Felsenstein, 1985) were used to estimate branch support: they were calculated in MEGA7 after 1000 random replications. Distance calculations were performed using the Kimura 2-parameter (K2P) method in MEGA7 (Kimura, 1980) including all sites, with the pairwise deletion option and assuming both a homogeneous pattern of divergence among lineages and a uniform rate of substitutions among sites. All records are publicly accessible in dataset DS-PUBLIML (dx.doi.org/10.5883/DS-PUBLIML) of BOLD v4 (www.boldsystems.org).

Repository abbreviations are as follows:

LMK	Landesmuseum Kärtern, Klagenfurt, Austria.
MNCR	Museo Nacional de Costa Rica, San José, Costa Rica.
MNHN	Muséum National d'Histoire Naturelle, Paris, France.
MZSP	Museo de Zoologia Universidad de Saõ Paulo, Saõ Paulo, Brazil.
NHMUK	Natural History Museum, London, England, United Kingdom.
PMJ	Phyletisches Museum, Jena, Germany.
USNM	National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA.
ZSM	Zoologische Staatssammlung München, München, Germany.
MLC	Personal collection of Michel Laguerre, 33850 Léognan, France.

Results and discussion

Using the so called barcode approach and searching all available sequences we get an access for we were able to build a distance tree for the neotropical members of the Lithosiini tribe containing 5895 sequences (not shown). In this tree the genus *Cloesia* appears intermixed with several species identified as *Dipaenae sp*. In these conditions we decide to study a tree containing both *Cloesia* and *Dipaenae*. This results in a 102 sequences distance tree which is shown below reduced to 26 sequences in order to decrease the redundacy.

Beside *Cloesia,* the genus *Dipaenae* Walker, 1854 was originally created to include several species previously included within *Euchromia* Hübner, [1819]. The genus contained among other species, *ferruginosa* (Walker, 1854), *contenta* (Walker, 1854) and *acharon* as an unnamed variation of *Euchromia acharon* Fabricius, [1777]. In 1980, Watson, Fletcher and Nye designated *ferruginosa* Walker, 1854 as the generotype (p. 56) and *acharon* became just a synonym. In 1983, H. de Toulgoët described *Dipaenae zygaenoides* from Saint-Jean-du-Maroni in French Guiana. The species seems externally rather divergent from other species found in French Guiana, *i.e., ferruginosa* and *incontenta* (Schaus, 1905). In fact, in BOLD, *zygaenoides* appears always within the genus *Cloesia* which is coherent with its external appearance and male genitalia (below for details). For these reasons this species is transferred to the genus *Cloesia* and is redescribed below under the name *Cloesia zygaenoides* (Toulgoët, 1983) **comb**. **n**.

At a minimum distance of 2.6 % it was found a second species of *Cloesia*, externally very similar to *zygaenoides*, but with totally different male genitalia. Hence this second species is described below as new under the name *Cloesia imitator* Laguerre **sp**. **n**.

In the distance tree and at a minimum distance of 3.7 % from *zygaenoides* a third cluster appears with three sequences originating

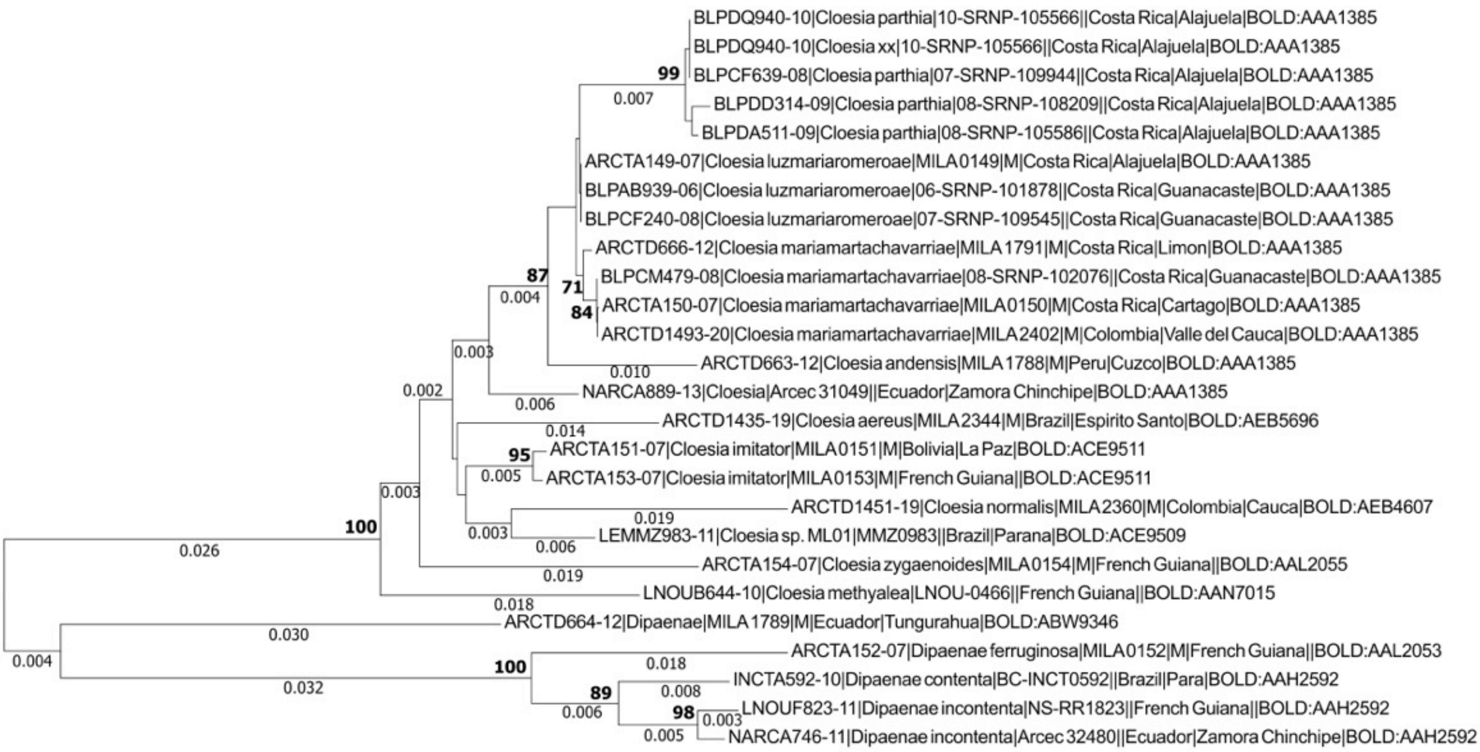
BLPDQ940-10|Cloesia parthia|10-SRNP-105566||Costa Rica|Alajuela|BOLD:AAA1385
BLPDQ940-10|Cloesia xx|10-SRNP-105566||Costa Rica|Alajuela|BOLD:AAA1385
99
BLPCF639-08|Cloesia parthia|07-SRNP-109944||Costa Rica|Alajuela|BOLD:AAA1385
0.007
BLPDD314-09|Cloesia parthia|08-SRNP-108209||Costa Rica|Alajuela|BOLD:AAA1385
BLPDA511-09|Cloesia parthia|08-SRNP-105586||Costa Rica|Alajuela|BOLD:AAA1385
ARCTA149-07|Cloesia luzmariaromeroae|MILA0149|M|Costa Rica|Alajuela|BOLD:AAA1385
BLPAB939-06|Cloesia luzmariaromeroae|06-SRNP-101878||Costa Rica|Guanacaste|BOLD:AAA1385
BLPCF240-08|Cloesia luzmariaromeroae|07-SRNP-109545||Costa Rica|Guanacaste|BOLD:AAA1385
ARCTD666-12|Cloesia mariamartachavarriae|MILA1791|M|Costa Rica|Limon|BOLD:AAA1385
87
71
BLPCM479-08|Cloesia mariamartachavarriae|08-SRNP-102076||Costa Rica|Guanacaste|BOLD:AAA1385
0.004
84
ARCTA150-07|Cloesia mariamartachavarriae|MILA0150|M|Costa Rica|Cartago|BOLD:AAA1385
ARCTD1493-20|Cloesia mariamartachavarriae|MILA2402|M|Colombia|Valle del Cauca|BOLD:AAA1385
0.003
0.010
ARCTD663-12|Cloesia andensis|MILA1788|M|Peru|Cuzco|BOLD:AAA1385
0.002
NARCA889-13|Cloesia|Arcec 31049||Ecuador|Zamora Chinchipe|BOLD:AAA1385
0.006
ARCTD1435-19|Cloesia aereus|MILA2344|M|Brazil|Espirito Santo|BOLD:AEB5696
0.014
95
ARCTA151-07|Cloesia imitator|MILA0151|M|Bolivia|La Paz|BOLD:ACE9511
0.005
ARCTA153-07|Cloesia imitator|MILA0153|M|French Guiana||BOLD:ACE9511
0.003
ARCTD1451-19|Cloesia normalis|MILA2360|M|Colombia|Cauca|BOLD:AEB4607
0.019
100
LEMMZ983-11|Cloesia sp. ML01|MMZ0983||Brazil|Parana|BOLD:ACE9509
0.026
0.003
0.006
ARCTA154-07|Cloesia zygaenoides|MILA0154|M|French Guiana||BOLD:AAL2055
0.019
LNOUB644-10|Cloesia methyalea|LNOU-0466||French Guiana||BOLD:AAN7015
0.018
ARCTD664-12|Dipaenae|MILA1789|M|Ecuador|Tungurahua|BOLD:ABW9346
0.030
ARCTA152-07|Dipaenae ferruginosa|MILA0152|M|French Guiana||BOLD:AAL2053
0.004
100
0.018
0.032
INCTA592-10|Dipaenae contenta|BC-INCT0592||Brazil|Para|BOLD:AAH2592
89
0.008
0.006
98
0.003
LNOUF823-11|Dipaenae incontenta|NS-RR1823||French Guiana||BOLD:AAH2592
0.005
NARCA746-11|Dipaenae incontenta|Arcec 32480||Ecuador|Zamora Chinchipe|BOLD:AAH2592

Fig. **1**. Neighbor-Joining tree reduced to 26 sequences of *Cloesia* and *Dipaenae* with 1000 bootstraps. Distances in % (only if larger than 0.2 %) normalized to 1 and bootstrap supports (in bold and only if larger than 70 %) are given near each branch (obtained with MEGA7, cf. KUMAR *et al*. 2016).

from two much worn specimens and one caterpillar, all from French Guiana. Fortunately enough, one the adult specimens was on loan and after preparation it appears that this species is in fact *Lithoprocris methyalea* Hampson, 1900 described from a single female collected on Rio Songo in Bolivia. Even if the external appearance of this species is rather divergent from the other *Cloesia* species, its sequence and male genitalia are totally coherent with the remaining of the group and so this species is transferred within the genus *Cloesia* under the name: *Cloesia methyalea* (Hampson, 1900) **comb. n**. By the way, it is very likely that *Lithoprocris hamon* (Druce, 1902) from Chanchamayo, Peru, is merely a synonym.

Two single sequences do not align with anything. One from Valle del Cauca, Colombia at a minimum distance of 2.5 % from anything else, can be identified as *Cloesia normalis* Dognin, 1911, precisely described from a locality only 50 km in the North-East. The second from Espirito Santo state in Brazil cannot be identified and is here described as new under the name *Cloesia aereus* Laguerre **sp**. **n**., the nearest neighbour being at least at 2.3 %.

Within the large cluster of the *digna/parthia* complex appears three sequences from Peru, Cuzco. These specimens are easy to distinguish from the Central America specimens due to the brownish-orange color of the hairs of the androconial pouch. Moreover, the male genitalia show large differences with all other species of the genus *Cloesia*. So, along with a similar pair collected in the Bolivian Yungas, they are described below as new under the name *Cloesia andensis* Laguerre **sp**. **n**., the shortest distance with the *digna/parthia* complex being at least 1.2%.

Close to this last species it is possible to find two more clusters from Costa Rica, the distance between them being around 0.9% only, but the male genitalia display very different patterns. One of the cluster is identified tentatively as *Cloesia parthia* (below for details) but the second cluster reveals two clearly different male genitalia corresponding to two homogeneous groups distant by only 0.2 % in the distance tree. The differences between male genitalia are so obvious that these two groups are described below as new species under the name *Cloesia mariamartachavarriae* Espinoza **sp**. **n**. and *Cloesia luzmariaromerae* Espinoza **sp**. **n**.

Finally at a distance of 1.2-1.3% from the complex *digna/parthia*, it is possible to find two sequences from Zamora-Chinchipe in southern Ecuador. No specimen was available for study but it is very likely that these two specimens represent a new undescribed entity.

The genus *Cloesia* Hampson, 1900

The genus contains around 10 to 12 small dark species with an average wingspan of 25-30 mm. Generally, the species have forewings dark grey to black with greenish or bluish metallic scales. The hindwings are generally grey with often an undulated margin. In males, a majority of species, but not all, displays an androconial pouch which is normally close. This transverse pouch is long and narrow and contains hairs with a characteristic color: they can be creamy white, buff yellow, brownish orange or bronzy green (Fig. 2). The females are generally duller with drab colors and devoid of the androconial pouch.

The male and female genitalia are diagnostic. In males the genitalia are symmetrical, the uncus is long and narrow, bent downward and with a pointed tip. The valvae are long and narrow, the tegumen at the base of uncus displays very often various processes, the transtilla is present with centrally two long and highly characteristic vertical processes. The juxta is long, narrow with a characteristic extremity. The aedeagus is cylindrical, often with a short caecum penis and a single lobed vesica bearing generally a unique area of thin cornuti. In females the diagnostic area comprises the part going from antrum to bursa copulatrix. There is a single signum shaped as a spiculate hollow.

I - Redescription of known *Cloesia* species

Cloesia digna Schaus, 1911

BIN BOLD:AAA1385 (in part) (Fig. 3)

Material examined

Holotype, ♂, Costa Rica, "Sixola" Riv. Type n°17238 (USNM, examined).

COSTA RICA

1 ♂, INBIOCRI000945001. Prov. Puntarenas, Peninsula de Osa, Rancho Quemado, 200m., Oct. 1992, F. Quesada. L_S_292500_511000.

1 ♂, INBIOCRI002372554. Puntarenas, Albergue Cerro de Oro, 150- 170 m. 13 FEB 1996. L. Angulo, de Luz. L_S_279650_518450. #7091.

1 ♂, INBIOCRI000216279. Prov. Punt., Pen. Osa, Rancho Quemado, F. Quesada, Feb 1991. L_S_292500_511000.

1 ♂, INBIOCRI002438508, (Dissected). Puntarenas, Albergue Cerro de Oro, 150-170 m. 10-25 MAR 1996. L. Angulo, de Luz. L_S_279650_518450. #7097.

1 ♂, INBIOCRI000674192. Prov. Limón, Res. Biol. Hitoy Cerere, Est. Hitoy-Cerere, Río Cerere, 200 m, G. Carballo, Set. 1990. L_N_184200_643300.

1 ♂, INB0003451113. Puntarenas Prov., San Vito, Las Cruces Biol. Sta., 1200 m. 16-20 N. 1987. I. Chacón.

1 ♂, INB0003451114. Puntarenas Prov., San Vito, Las Cruces Biol. Sta., 1200 m, 16-20 N. 1987. I. Chacón.

1 ♀, INB0003451116. Las Cruces Biol. Sta., San Vito, Puntarenas Prov., COSTA RICA, 1200 m, 16-20 N. 1987. I. Chacón.

1 ♀, INB0003456395. Alajuela Prov., Fca La Campana. El Ensayo, 7km NW Dos Ríos, 700 m, 15-17 Mar 1986. DH Janzen & W. Hallwachs.

1 ♀, INBIOCRI000641706, (Dissected). Prov. Limón, P.N. Tortuguero, Est. Cuatro Esquinas, 0 m, R. Delgado, Nov 1990. L_N_280000_590500.

1 ♀, INB0003409006. Heredia Prov., Puerto Viejo de Sarapiquí, La Selva Biol. Sta., 40 m, Apr 1987 M. M. Chavarría.

1 ♀, INBIOCRI000116369. San José Prov., Res. Biol. Carara, Estac. Bijagual, 500 m, Nov 1989, R. Zuniga, 192250, 474760.

1 ♀, INBIOCRI001738716. Prov. Alajuela, Sector San Ramón, 620m., 13-28 Mar 1994. D. García, L_N_318100_381900. #2766.

1 ♀, INB0003554858. Prov. Puntarenas, P. N. Piedras Blancas, Alrederores de Est. el Bonito, 100-200 m, 2-6 NOV 2002. M. Moraga. Tp. de Luz. L_S_292700_548350. #72181.

Deposited MNCR.

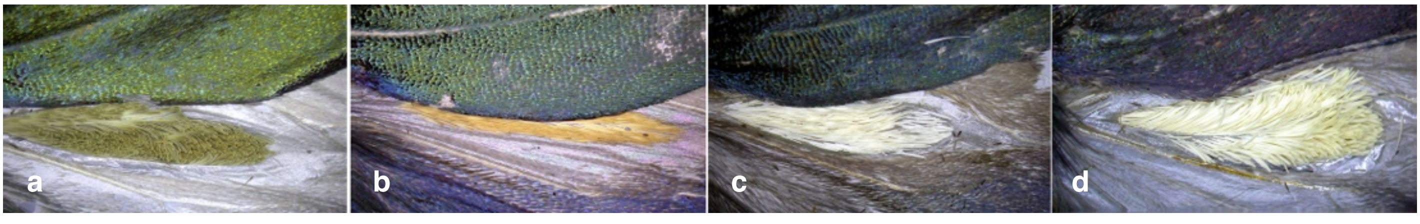

Fig. **2**. Various androconial pouch.

a. *Cloesia aereus* Laguerre **sp**. **n**. – **b**. *Cloesia andensis* Laguerre **sp**. **n**. – **c**. *Cloesia imitator* Laguerre **sp**. **n**. – **d**. *Cloesia zygaenoides* (Toulgoët, 1983).

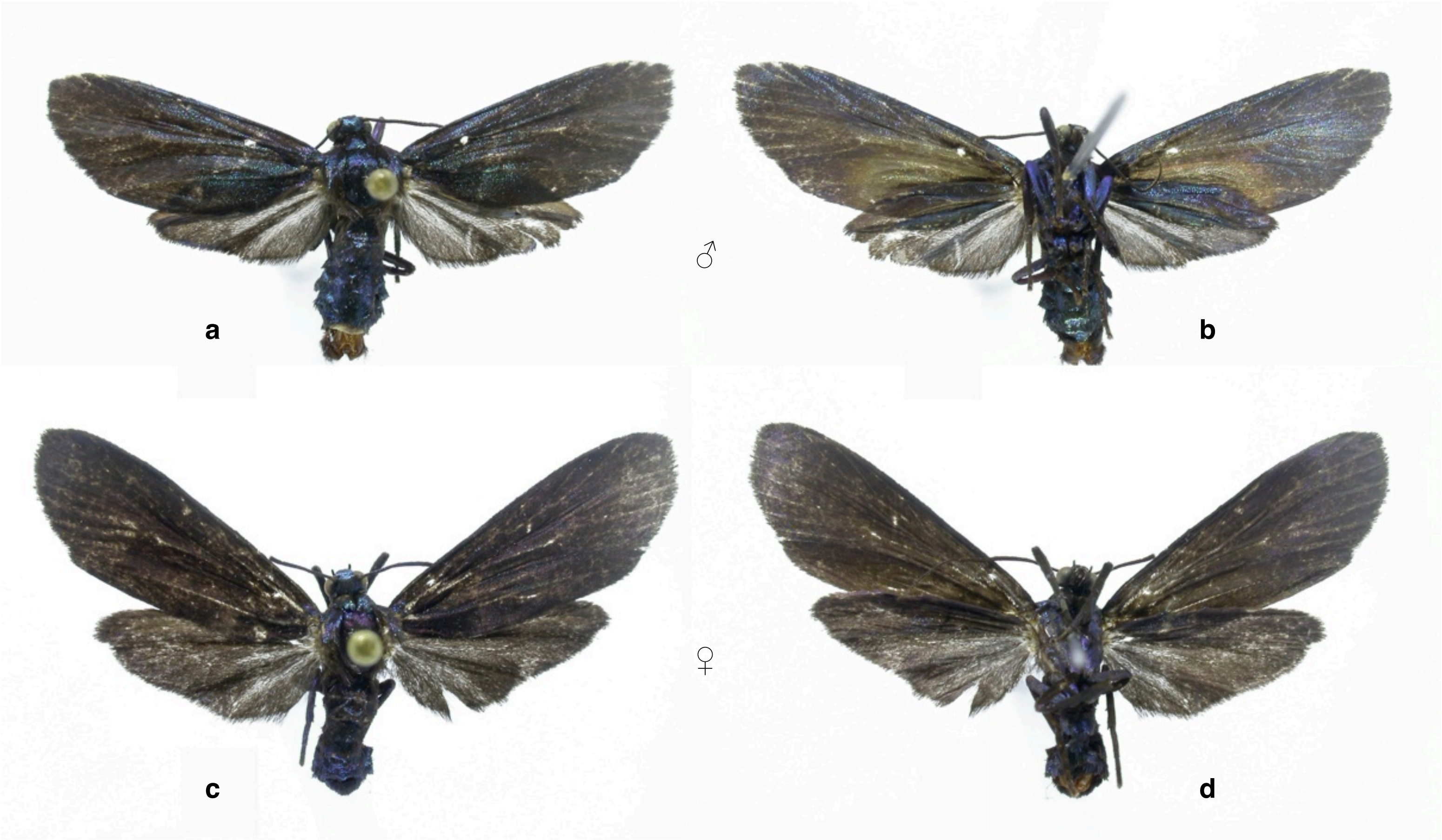

Fig. **3**. *Cloesia digna* Schaus, 1911 from Costa Rica.
a & **b**. ♂ (INBIOCRI000945001). **a**. Dorsal view. **b**. Ventral view. **c** & **d**. ♀ (INB0003451116). **c**. Dorsal view. **d**. Ventral view.

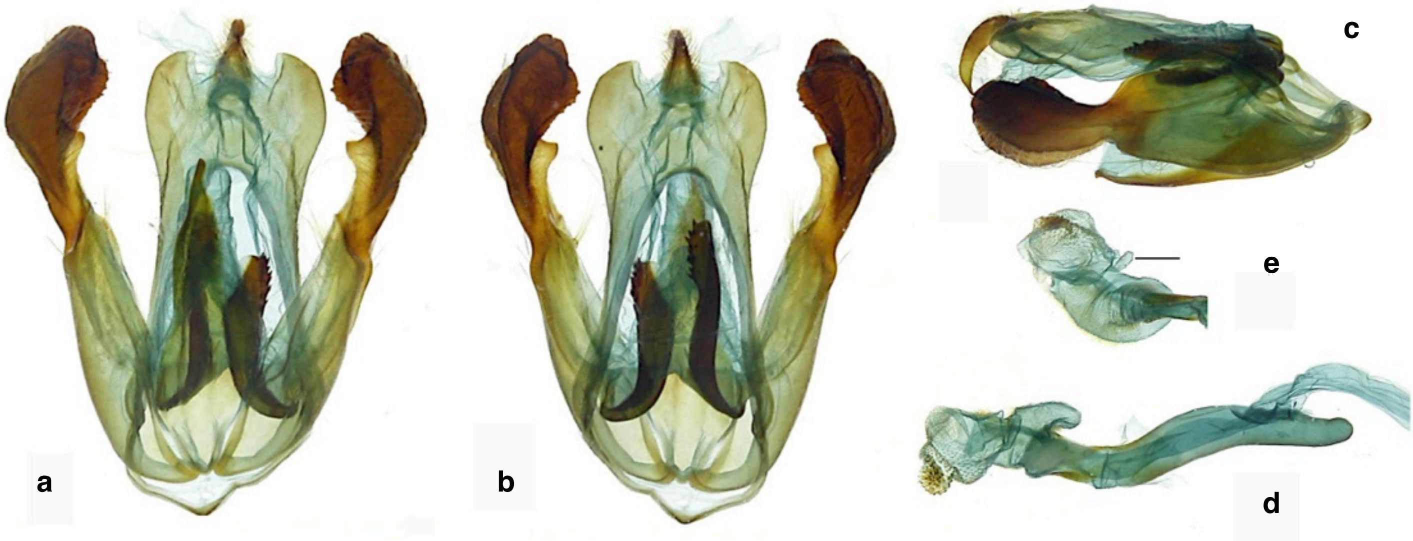

Fig. **4**. *Cloesia digna* Schaus, 1911 from Costa Rica, genitalia ♂ (INBIOCRI002438508).
a. Ventral view. **b**. Dorsal view. **c**. Lateral view. **d**. Aedeagus with everted vesica. **e**. Detail of the vesica showing the finger shaped lobe.

Diagnosis. – *C. digna* is recognized by having the body and forewings above dark metallic purplish-blue. Hindwings dark brown, thinly scaled, with somewhat semihyaline streaks on basal and median area, below discal cell. Androconial pouch on hindwing present, although it is not mentioned by Schaus in the original description (Schaus, 1911) nor Hampson's posterior description of this species (Hampson, 1914). In the male genitalia *C. digna* presents a small elongate finger-shaped lobe arising ventrally and to the left side of vesica, that is also characteristic of this species.

Male (Fig. 3a-b). INBIOCRI000945001

Forewing length 14.0-15.4 mm (n = 8). Head, thorax and abdomen dark metallic blue. Labial palpi short, upturned, basal and middle segment with elongate scales. Antenna filiform, with metallic blue scales dorsally, brown ventrally. Legs dark metallic blue. Forewing dark metallic purplish-blue. Hindwing thinly scaled, dark brown, with metallic purplish-blue distally on the apex, basal and median area below discal cell with somewhat semihyaline streaks like. Ventrally both wings dark brown suffused with brilliant metallic blue and with an elongate androconial pouch on hindwing. Abdomen dark metallic purplish-blue dorsally and ventrally; distal half with modified segments laterally, an opened cavity resembling a Geometridae tympanic organ, which is in fact the retracted androconial organ.

Male genitalia (Fig. 4a-e). INBIOCRI002438508

Uncus short, sclerotized, curved downward ventrally, with a pointed tip and covered by short bristles. Tegumen elongate, expanded laterally, with two projections, slightly rounded outer edges, pointed tip and slightly wrinkled on dorsal surface. Valva elongate, basal half thick, slightly narrowed in the middle, distal half heavily sclerotized, irregular mass-shaped, with dorsal surface flattened, slightly rough and sharpened edges; ventral surface flattened, moderately covered by long bristles and with a short triangular sclerotized and flattened process arising inward. Transtilla formed by two strongly sclerotized processes, elongate, covered by thick, short spines dorsally on distal half, left projection slightly longer than right projection. Juxta sclerotized, elongate, longer than basal half of valva, convex, with a tiny pointed tip, horn-shaped, arising ventrally. Saccus absent. Aedeagus elongate, anterior end slightly curved to the right in dorsal view, thick in the middle, posterior end slightly curved upward in lateral view; vesica short, bean-shaped, membranous, a small elongate lobe arising ventrally and to the left side, finger-shaped. A patch of short and thick spines ventrally on posterior portion of vesica, which extends dorsally with smaller spines; dorsal and lateral surface of anterior half and base of vesica covered by a large patch of minute bristles.

Female (Fig. 3c-d). INB0003451116

Forewing length 13.0-15.1mm (n = 7). In general terms as the male, the only difference is on hindwing, which is devoid of the somewhat semihyaline streaks on basal and median areas, but fully dark brown.

Female genitalia (Fig. 23a). INBIOCRI000641706

Papilla analis slightly sclerotized, square-shaped, scarcely covered by elongate bristles and with a patch of short bristles anterodorsally. Posterior apophysis the same length than anterior apophysis. Segments IX+X arising upward dorsally, exposing papilla analis dorsally in natural position. Segment VIII strongly reduced in side compared with VII segment. Segment VII strongly modified ventrally. Ostium bursae surrounded by a large, prominent sclerotized structure arising posteriorly, composed by the lamella antevaginalis and lamella postvaginalis. Lamella antevaginalis slightly expanded laterally and concave. Antrum slightly sclerotized. Ductus bursae short, robust and membranous, with a somewhat rugose surface. Corpus bursae large, striate, nut-shaped; basal portion composed by an irregular lobe, sinuous, slightly sclerotized, compressed and wrinkled. A small concave signum on ventral surface, round-shaped, covered by tiny thick spines on its interior surface. A large and thick basal membranous lobe arising ventrally, which joins the ductus seminalis with corpus bursae.

Early stages. – Unknown.

Distribution. – *Cloesia digna* is an uncommon species found in the South of Costa Rica, between 100 and 1200 m elevation. It was described from "Sixola Riv" Costa Rica, which is lowlands on the Caribbean slope, near the border with Panamá, but it is also present southern on the Pacific slope near the border with Panamá. Some few records are reported from the central area of the country.

Cloesia normalis Dognin, 1911

BIN BOLD:AEB4607 (Fig. 5)

Material examined

Holotype, ♂, COLOMBIA, Cali, Alto de las Cruces, *Fassl*, VII-1909, in USNM, examined.

COLOMBIA

1 ♂, Cauca, Popayan, Finca La Coronilla, 21-XI-2017, 1670 m, 2.549 -76.62, C. Gonzáles, J. Díaz, R. Rougerie, T. Decaens *leg*. IAvH-E-200868. Sequenced, Process ID ARCTD1451-19, BOLD ID MILA 2360 (yellow printed label). Dissected Gen. ML3612 (light blue manuscript label).

Diagnosis. – A dark steel blue species, devoid of androconial pouch. The hindwings are wide with a single undulation and shot with steel blue reflection in the distal half. The male genitalia are characterized by the transtilla arms sharply bent externally at 90° in their extremities.

Male (Fig. 5a-b)

Forewing length: 16 mm. A species with larger wings compared to other species. Antennae black, ciliate. Head and tegulae black with strong steel blue reflection. Patagia and thorax black. Palpi black. Legs black with a strong steel blue reflection on femurs. Abdomen black with blue hue. Forewings almost black with a steel blue reflection. Hindwings devoid of androconial pouch, dark grey with a strong steel blue reflection on their distal half. Below dark grey with a large and uniform blue reflection on the entire surface, except the internal border of forewings.

Male genitalia (Fig. 6a-d)

The uncus is enlarged in the basal half and abruptly narrowed in the distal half, laterally it is bent downward with a sharp pointed tip. Valvae are symmetrical reaching almost the tip of uncus. Their basal half is narrowed and the distal half is spoon shaped and distinctly sclerotized. The tegumen below the uncus displays a wide subrectangular thin process on each side. The vinculum is evenly rounded and the saccus is tiny. The juxta is relatively short, rectangular, enlarged on tip with three blunt teeth. The transtilla displays very long and narrow arms, abruptly bent outwards at 90° on their extremities. The aedeagus is short and slightly bulbous, the extremity is covered by a large patch of tiny cornuti. The vesica displays a perpendicular lobe which is partially spiculate.

Female. – Unknown.

Early stages. – Unknown.

Distribution. – Presently only known from Colombia in the Cauca and Valle del Cauca departments.

Cloesia parthia (Druce, 1899)

BIN BOLD:AAA1385 (in part)

Material examined

Holotype, ♂, PANAMA, Bugaba, *Champion*, in NHMUK, examined (Fig. 7).

Remarks. – This species is very difficult to identify from its external appearance only. Nevertheless, it was possible to take a macrophoto of the tip of the type abdomen which reveals very huge tegumen expansions separated by a deep valley which allows to see the entire uncus (Fig. 7, on the right). The type was described from Bugaba in Panama not far from the Costa Rica border and so the species must be present in Costa Rica. The only entity with very huge tegumen expansions and similar genitalia features is the species described below and until the male holotype is dissected, we will consider this entity as *Cloesia parthia*.

COSTA RICA

1 ♂, 07-SRNP-109944, dissected. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincon Rain Forest, Estación Caribe (melina), 391 m, F. Quesada & R. Franco. 11/9/2007. 10.89560, -85.29558.

1 ♂, 08-SRNP-105586. Prov. Guanacaste, Área de Conservación Guanacaste,

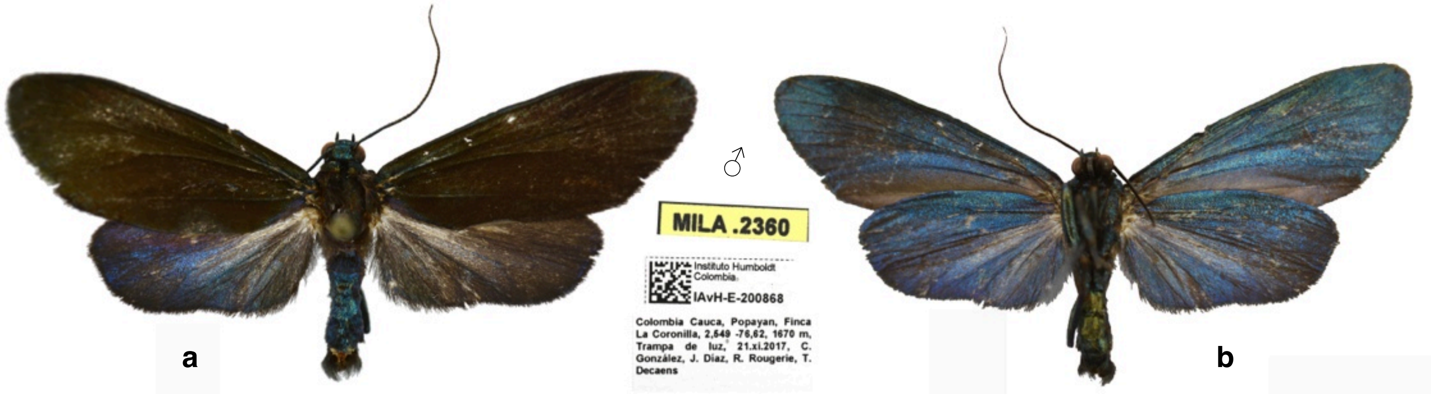
♂
MILA .2360
Instituto Humboldt
Colombia
IAvH-E-200868
Colombia Cauca, Popayan, Finca La Coronilla, 2,649 -76,62, 1670 m, Trampa de luz, 21.xi.2017, C. González, J. Díaz, R. Rougerie, T. Decaens
a
b

Fig. 5. *Cloesia normalis* Dognin, 1911, ♂, from Colombia. **a**. Dorsal view. **b**. Ventral view.

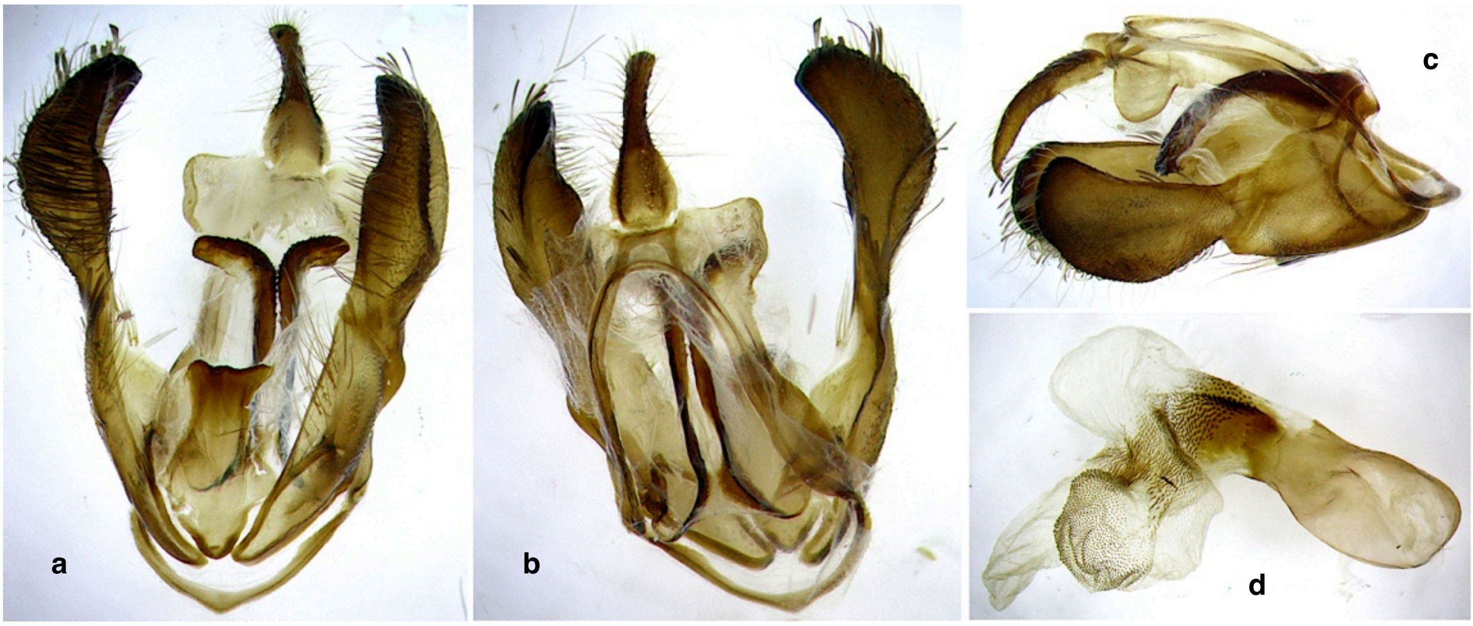

Fig. 6. *Cloesia normalis* Dognin, 1911 from Colombia, genitalia ♂. **a**. Ventral view. **b**. Dorsal view. **c**. Lateral view. **d**. Aedeagus with everted vesica.

Sector Rincón Rain Forest, Jabalina, Manta Pizote, 288 m, R. Franco & F. Quesada. 8/30/2008. 10.97325, -85.31542.

1 ♂, 10-SRNP-105566. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Albergue Oscar, Casa, 725 m, 2/13/2010. 10.86627, -85.32605.

1 ♂, INB0004173090. Prov. Limón, Veragua Rainforest, Restaurant, 400-440 m, 1-16 OCT 2008. R. Villalobos. Tp. Luz Mercurio. L_N_212220_625230. #94997.

1 ♂, INBIOCRI000002441. Prov. Limón, P. N. Tortuguero, Cerro Tortuguero, 100 m, April1989. R. Aguilar & J. Solano. 285000_588000.

1 ♂, INBIOCRI000678255. Prov. Limón, Sector Cerro Cocori, Fca. de E. Rojas, E. Rojas. Ene 1991. L_N_286000_567500.

1 ♂, INBIOCRI000221128. Prov. Heredia, P.N. Braulio Carrillo, Est. Magsasay, 200 m, C. Alvarado, Jun 1990. L_N_264600_531100.

1 ♂, INBIOCRI002539364. Prov. Alajuela, P.N. Volcán Tenorio, Puesto Quebradón. 300 m, ABR 1997. G. Rodríguez. L_N_292050_436700. #46262.

1 ♂, INB0004164915. Prov. Limón, Veragua Rainforest, Restaurant, 400-440 m, OCT 2008, R. Villalobos. Tp Luz Mercurio. L_N_212220_625230. #94756.

1 ♂, INB0004164944, (Dissected). Prov. Limón, Veragua Rainforest, Restaurant, 400-440 m, OCT 2008, R. Villalobos. Tp Luz Mercurio. L_N_212220_625230. #94756.

1 ♂, INBIOCRI000588703. Prov. Limón, Sector Cerro Cocori, Fca de E. Rojas, 150 m, E. Rojas, AGO 1991. L_N_286000_567500.

1 ♂, INB0003226154. Prov. Heredia, La Selva Biol. Stat., 10 26'N, 84 01'W. 18 February, 2003. D Wagner, at MV lt.

1 ♀, INB000CRI000003287, (Dissected). Prov. Limón, P.N. Tortuguero, Cerro Tortuguero, 100 m, April 1989, R. Aguilar & J. Solano. 285000_588000.

1 ♀, 10-SRNP-107560. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Manta Hugo, 491 m, H. Cambronero & F. Quesada. 3/15/2009. 10.88110, -85.26770.

Deposited MNCR.

3 ♂, Guanacaste, Albergue de Oscar, 17-V-2010, 700 m, 10°51.982' N 85°19.56' W, M. Laguerre *leg.*, one ♂ is dissected Gen. ML3618 (light blue manuscript name).

Deposited MLC.

NICARAGUA

1 ♂, Río San Juan, Reserva de Bartola, 4 au 8-VIII-2000, 200 m, M. Laguerre *leg.*, dissected Gen ML719 (white manucript label).

Deposited MLC.

Diagnosis. – This species is similar to *Cloesia digna*, and difficult to separate by adult patterns, but it can be distinguished by the shape of tegumen, which is strongly expanded laterally in this species. The shape of the vesica is also different and specially the different positions and sizes of lobes, in particular the small elongate finger-shaped lobe arising

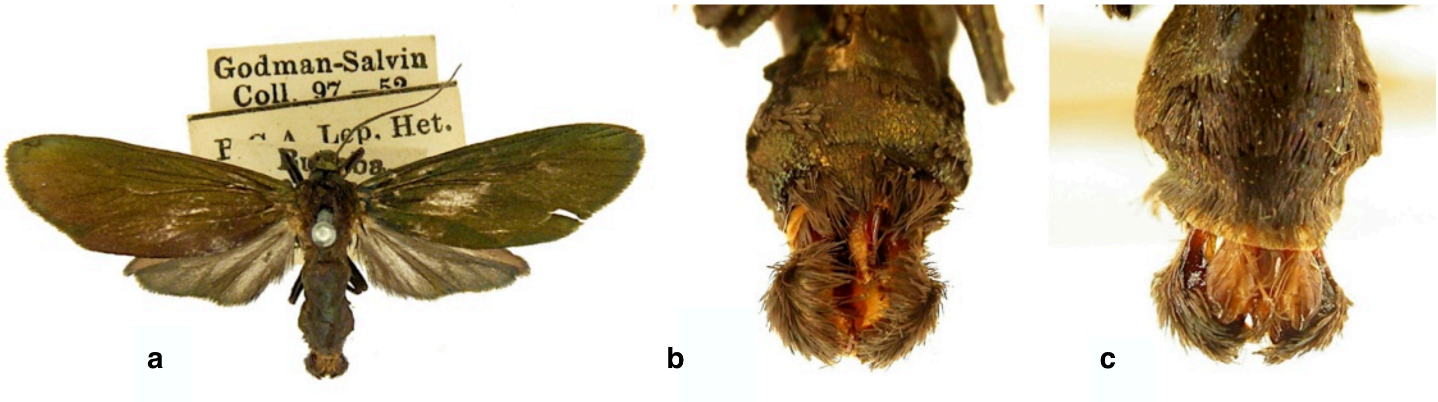

Fig. **7**. *Cloesia parthia* (Druce, 1899) from Bugaba, Panama, holotype, ♂ (NHMUK). **a**. Dorsal view. **b**. Close up of the abdomen tip ventrally. **c**. Close up of abdomen tip dorsally.

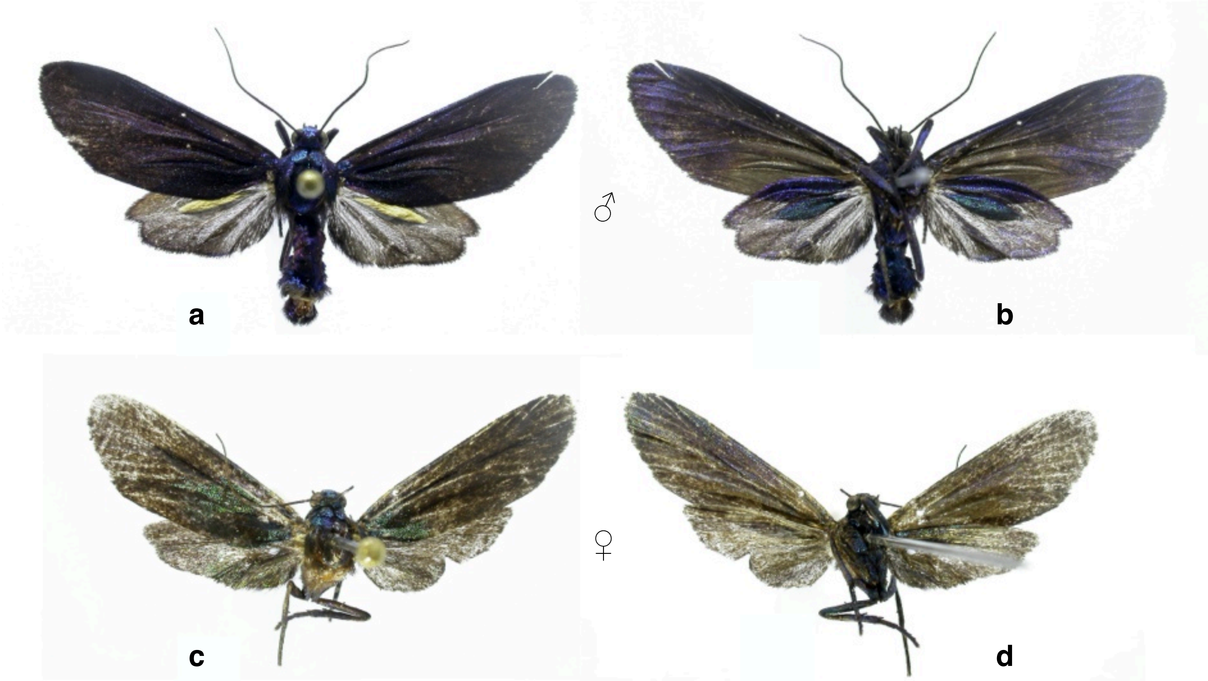

Fig. **8**. *Cloesia parthia* (Druce, 1899) from Costa Rica. **a** & **b**. ♂ (INB0003226154). **a**. Dorsal view. **b**. Ventral view. **c** & **d**. ♀ (INBIOCRI000003287). **c**. Dorsal view. **d**. Ventral view.

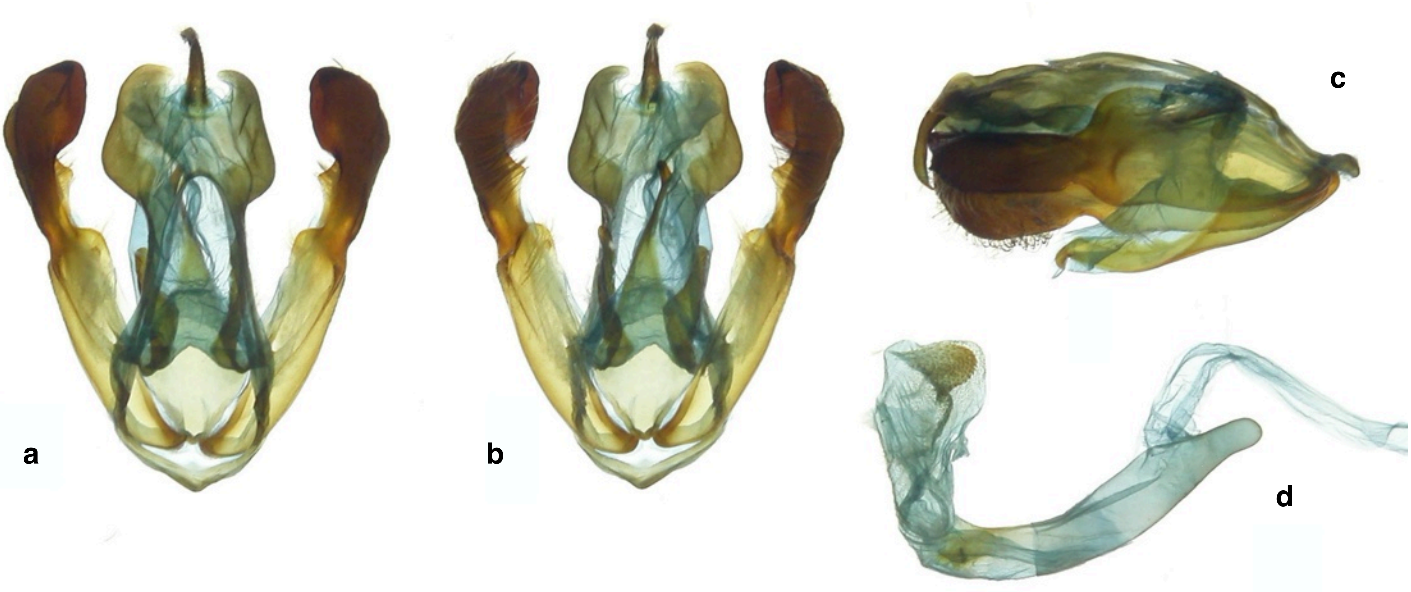

Fig. **9**. *Cloesia parthia* (Druce, 1899) from Costa Rica, genitalia ♂ (INB0004164944). **a**. Dorsal view. **b**. Ventral view. **c**. Lateral view. **d**. Aedeagus with everted vesica.

ventrally and to its left side, which is characteristic of *C. digna*, is there absent.

Male (Fig. 8a-b). INB0003226154

Forewing length 13.35-15.0 mm (n = 10). Head, thorax and abdomen dark metallic purplish-blue. Labial palpi short, upturned, basal and middle segment with elongate scales. Antenna filiform, with metallic blue scales dorsally, brown ventrally. Coxae and legs dark metallic blue. Forewing dark metallic greenish-blue. Hindwing thinly scaled, dark brown suffused with dark metallic purplish-blue distally on the apex and on outer margin; basal and median area below discal cell with somewhat semihyaline streaks. Ventrally, both wings dark brown suffused with brilliant metallic blue and with an elongate androconial pouch on hindwing. Abdomen dark metallic purplish-blue dorsally and ventrally; distally on the last segment with presence of an androconial organ.

Male genitalia (Fig. 9a-d). INB0004164944

Uncus thin, elongate, strongly sclerotized, curved downward ventrally, with a pointed tip and scarcely covered by long bristles. Tegumen elongated, strongly expanded laterally on distal portion, projecting posteriorly, with a rounded tip curved downward ventrally and inward. Valvae very broad on the basal half, rectangular-shaped, with a small process on its internal surface, arising medially and covered by long bristles; distal half elongated, strongly sclerotized, with a short triangular projection arising inward on its interior surface, the tip strongly lobulated, with the costal margin projected inward and flattened dorsoventrally; ventral margin covered by long bristles and ending in a short and flattened projection. Transtilla with two elongated and sclerotized processes, left process longer than right process. Juxta elongated, sclerotized, convex, very broad on the basal half and very thin on the distal half, with a short and strongly sclerotized horn-shaped process arising ventrally on the tip. Saccus absent. Aedeagus elongated, slightly sclerotized, slightly curved upward dorsally on its posterior end. Vesica short, with a short robust lobe arising basally on the right side, a second small lobe arising medially on the anterior surface, a third small lobe arising medially on the posterior surface, slightly triangular in shape and a large lobe, arising distally on the right side, totally covered by thick and short spines.

Female (Fig. 8c-d). INBIOCRI000003287

Forewing length 13.9-14.3mm (n = 2). In general terms the female looks like the male, and it only differs on hindwings, which are fully dark brown rather than the somewhat semihyaline streaks present in male.

Female genitalia (Fig. 23d). INB000CRI000003287

Papillae anales slightly sclerotized, rectangular-shaped, scarcely covered by elongate bristles, a patch of short bristles on the antero-basal area. Posterior apophyses slightly shorter than anterior apophyses. Segments IX+X arising upward dorsally, exposing papillae anales dorsally in natural position. A membranous lobe arising upward dorsally on segments IX+X, behind the papillae anales. Segment VIII strongly reduced in side compared with segment VII. Sternum VII strongly modified ventrally. Ostium bursae surrounded by a large, prominent sclerotized structure, arising posteriorly, composed by the lamella antevaginalis and lamella postvaginalis. Lamella antevaginalis with a strongly concave plate, expanded laterally. Antrum + ductus bursae very short, thick, membranous and slightly rugose. Corpus bursae large, lobed, striate, basal portion slightly sclerotized and rugose. A small rounded signum, concave, with tiny and thick spines on its interior surface.

Early stages. – Unknown.

Distribution. – *Cloesia parthia* was originally described from a unique specimen from Bugaba in Panamá, a locality near the border with Costa Rica, on the Pacific slope, with approximately 350 m elevation. In Costa Rica the species has been collected mainly on lowlands, from 150 to 735 m altitude and North up to Guanacaste/Alajuela. The species is also found in the extreme South of Nicaragua near the Alajuela border in Costa Rica.

II - Redescription of species newly transferred to *Cloesia*.

Cloesia methyalea (Hampson, 1900) **comb. n.**

BIN BOLD:AAN7015

Material examined

Holotype, ♀, BOLIVIA. Songo (Garlepp), 98-151. In NHMUK, examined.

FRENCH GUIANA

1 ♂, Piste de Kaw, PK 40 + 2, 24-VII-2003, 260 M, 4°32.535' N 52°07.485' W, M. Laguerre *leg*.

1 ♂, Piste de Kaw, PK15, 27-II-2006, M. Laguerre *leg*., dissected Gen. ML3613 (light-blue manuscript label).

1 ♂, Piste Patagaï, 5-IX-2018, 54 m, 5°24'51.85" N 53°10'32.55" W, M. Laguerre *leg*.

1 ♀, Piste de Saut Léodate, PK12, 12-II-1999, M. Laguerre *leg*.

1 ♂, Piste Coralie, PK 7.4, 22-VII-2001, M. Laguerre *leg*.

1 ♂, Same data but PK 7.5 and 25-VII-2003, 50 m.

1 ♀, Piste de Kaw, PK32 + 2.3, 2-VIII-2003, 240 m, 4°34.325' N 52°11.460' W, M. Laguerre *leg*., dissected Gen. ML3634 (light-blue manuscript label).

1 ♂, Piste de Kaw, PK37.5 + 2, 30-VII-2003, 200 m, 4°33.691' N 52°08.391' W, M. Laguerre *leg*., dissected Gen. ML712.

1 ♂, Piste de Kaw, PK 37.5, 22-II-2006, 270 m, 4°32.908' N 52°08.728' W, M. Laguerre *leg*.

All in MLC.

1 ♂, Summit Inselberg, Nourag[u]es, 28-I-2010, Lt: 4.09642° Ln: -52.68282°, 419 m, Carlos Lopez Vaamonde *leg*., LNOU-0466, dissected Gen. ML3628 (light-blue manuscript), sequenced Process ID LNOUB644-10, BOLD ID LNOU-0466 (yellow printed label).

In MNHN.

Diagnosis. – A divergent species characterized by steel-blue forewings and hindwings devoid of the androconial pouch, but with a largely white disk. In the male genitalia the juxta is long, narrow and strongly pointed and the transtilla processes are very short. The female genitalia are highly diagnostic.

Male (Fig. 10a-b)

Forewing length: 13-14 mm. Antennae black, thin and ciliate. Head, tegulae and thorax black with a steel blue hue. Patagia black. Palpi very short, black. Legs black with a weak blue reflection on tibias. Abdomen lustrous, black with a strong blue reflection. Forewings black with a dark blue reflection. Hindwings black with the entire disk almost translucent. The distal part of the wings with a strong steel blue reflection. Below as above, the forewings dark grey and not black.

Male genitalia (Fig. 11a-d)

The uncus is enlarged basally, then constricted in the middle and ovoid at the end with a pointed tip. The tegumen displays on each side a small triangular expansion below uncus. The vinculum is evenly rounded and the saccus almost absent. Valvae are symmetrical, almost as long as the tip of uncus, elongated and subrectangular with their extremities enlarged, spoon shaped, with a small spike dorsally. Juxta is narrow, as long as half the valvae, with a strong spine at tip. The transtilla arms are very short and hardly visible. The aedeagus is short, almost straight with a three lobed vesica perpendicular to the main axis. There is a large patch of small cornuti at the base of lobes 2 and 3. All three lobes are smooth.

Female (Fig. 10c-d)

Forewing length: 14 mm. Similar to male but the reflection on forewings is dull purplish blue. On hindwings the reflection is less intense and the translucent disk is blurred by dark scales.

Female genitalia (Fig. 12d)

Papillae anales subrectangular, apophyses long and thin, the anteriores longer than the posteriores. Antrum strongly sclerotized, almost cylindrical with a carina ventrally. Ductus bursa with a strongly sclerotized curved triangular plate. The bursa copulatrix small, entirely wrinkled with a rounded verrucate signum.

Early stages. – Unknown.

Distribution. – Presently known from French Guiana where the species is rather common and from the Bolivian Yungas.

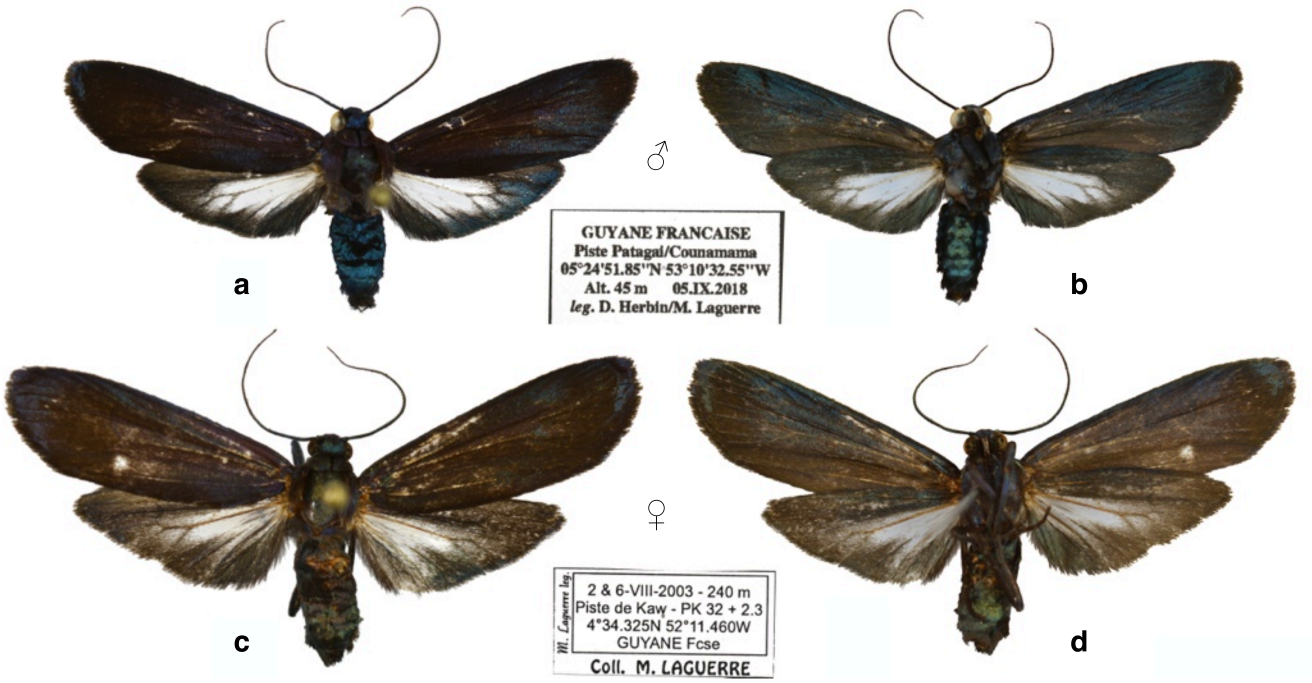

Fig. **10**. *Cloesia methyalea* (Hampson, 1900) **comb**. **n**. from French Guiana. **a** & **b**. ♂. **a**. Dorsal view. **b**. Ventral view. **c** & **d**. ♀. **c**. Dorsal view. **d**. Ventral view.

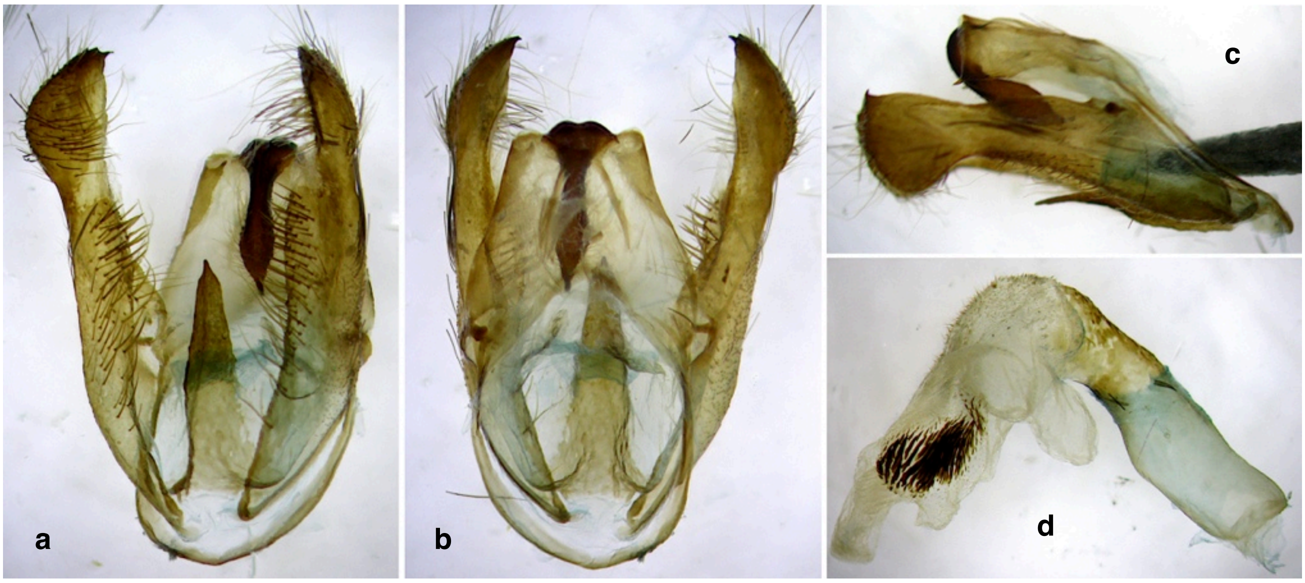

Fig. **11**. *Cloesia methyalea* (Hampson, 1900) **comb**. **n**. from French Guiana, genitalia ♂. **a**. Ventral view. **b**. Dorsal view. **c**. Lateral view. **d**. Aedeagus with everted vesica.

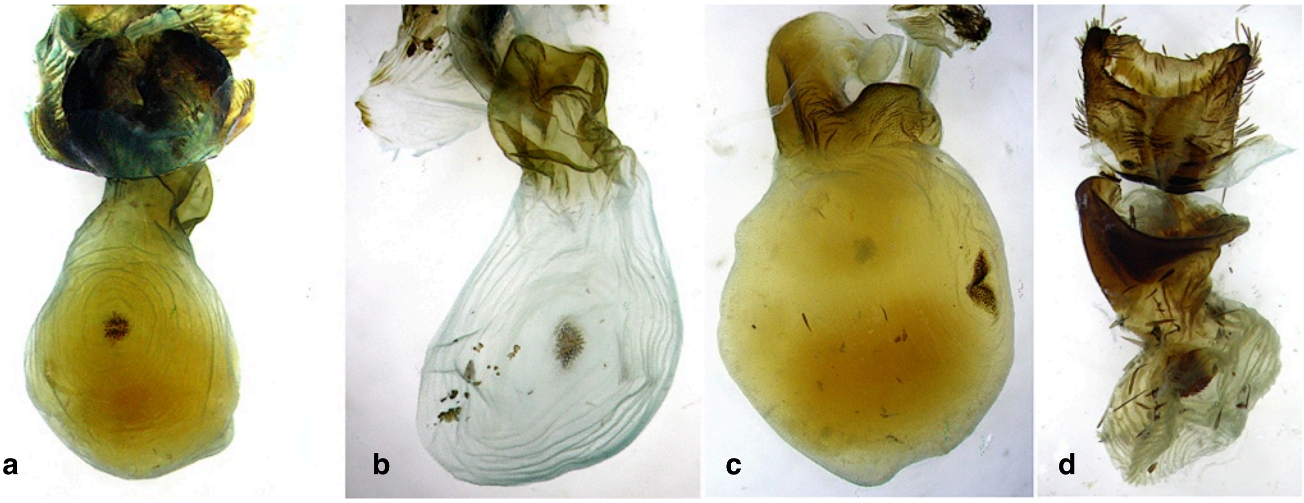

Fig. **12**. Genitalia ♀ of various *Cloesia*. Only the antrum and the bursa copulatrix are shown. **a**. *Cloesia imitator* **sp**. **n**. from French Guiana. **b**. *Cloesia andensis* **sp**. **n**. from Bolivia. **c**. *Cloesia zygaenoides* (Toulgoët, 1983) **comb**. **n**. from French Guiana. **d**. *Cloesia methyalea* (Hampson, 1900) **comb**. **n**. from French Guiana.

Cloesia zygaenoides (Toulgoët, 1983) **comb. n.**

BIN BOLD:AAL2055

Material examined

Holotype, ♂, French Guiana, environ de Saint-Jean-du-Maroni, I-1980. In MNHN, examined.

FRENCH GUIANA

1 ♂. Piste du Dégrad Florian, PK 14, 5-VIII-2003, 70 m, 5°26.870' N 53°31.348' W, M. Laguerre *leg*., dissected Gen. ML3610 (light-blue manuscript label), sequenced, Process ID ARCTA154-07, BOLD ID MILA 0154 (yellow manuscript label).

1 ♂, same data but PK12 and 29-VII-2001.

1 ♂, Rte d'Apatou, 5-X-2015, 99 m, 5°15'50.7" N 54°12'01.3" W, M. Laguerre *leg*.

1 ♂, Piste du Plateau des Mines, 4-X-2015, 49 m, 5°20'42.6" N 54°04'32.0" W, M. Laguerre *leg*.

1 ♂, Piste de Kaw, PK 38, 18-I-1996, M. Laguerre *leg*., dissected Gen. ML710 (white manuscript label).

1 ♂, same data but 21-I-1996.

1 ♂, Piste de Bélizon, PK 27, 20-VII-2001, M. Laguerre *leg*.

1 ♂, Piste Coralie, PK7.4, 22-VII-2001, M. Laguerre *leg*.

1 ♂, Piste de Kaw, PK37 + 3.3, 31-VII-2001, M. Laguerre *leg*., dissected Gen. ML724 (white manuscript label).

1 ♂, same data but PK 37 + 2 and 30-VII-2003.

1 ♂, Piste de Kaw, PK32, 3-III-2005, M. Laguerre *leg*.

1 ♂, Piste de Kaw, PK15, 27-II-2005, M. Laguerre *leg*.

1 ♀, Piste de Kaw, PK32+2.3, 2-VIII-2003, 240 m, 4°34.325' N 52°11.460' W, M. Laguerre *leg*., dissected Gen. ML727 (white manuscript label).

1 ♀, Piste de Bélizon, PK20+1, 28-VII-2003, 120 m, 4°17.613' N 52°24.385' W, M. Laguerre *leg*., dissected Gen. ML3633 (light-blue manuscript label).

All in MLC.

Diagnosis. – A dark grey species with light grey hindwings displaying two successive undulations on termen. The androconial pouch is long and wide, filled with buff-yellow hairs. The male genitalia are characteristic with strong rounded processes on tegumen at the base of uncus.

Male (Fig. 13a-b)

Forewing length: 12-13 mm. Antennae black, thin and ciliate. Head, tegulae, thorax and patagia black with a dull purplish hue. Palpi short and black. Abdomen black with a strong steel blue suffusion. Legs black with a dull bluish reflection. Forewings dark grey with a dull purplish hue. Hindwings light grey with a thin black border. The termen with two successive undulations. The androconial pouch present and large, full of buff-yellow hairs. Underside as upper side, the androconial pouch present as a blackish oval patch. A greenish blue reflection on the apical area of forewings.

Male genitalia (Fig. 14a-d)

Uncus long and thin, slightly ovoid in middle, with a strong spine pointing below. The tegumen expansions strongly sclerotized, almost half circular, largely going down ventrally. The valvae reaching the base of uncus, base enlarged with a triangular expansion inward, constricted in middle, the terminal part narrowed, clearly bent inward, with a small spine at base. Vinculum narrowed with a short triangular saccus. Juxta reaching half the valvae, shaped as a flame with a blunt extremity. Transtilla almost invisible. Aedeagus short, bulbous with a single lobed vesica at 90°. A patch of strong cornuti at the beginning of the lobe.

Female (Fig. 13c-d)

Forewing length: 13-14 mm. Similar to male but all four wings dull dark grey. Hindwing without undulations and devoid of the androconial pouch.

Female genitalia (Fig. 12c)

Papillae anales subtrapezoidal, apophyses long and thin, the anteriores slightly longer than the posteriores. Antrum and ductus bursa slightly sclerotized, first narrow then largely expansed and slightly spiculate. Near the junction of ductus bursa and bursa copulatrix, presence of a short cylindrical process pointing outside. Bursa copulatrix smooth, almost spherical with an oval verrucate signum depressed in the middle.

Early stages. – Unknown.

Distribution. – Presently known from French Guiana where the species is common.

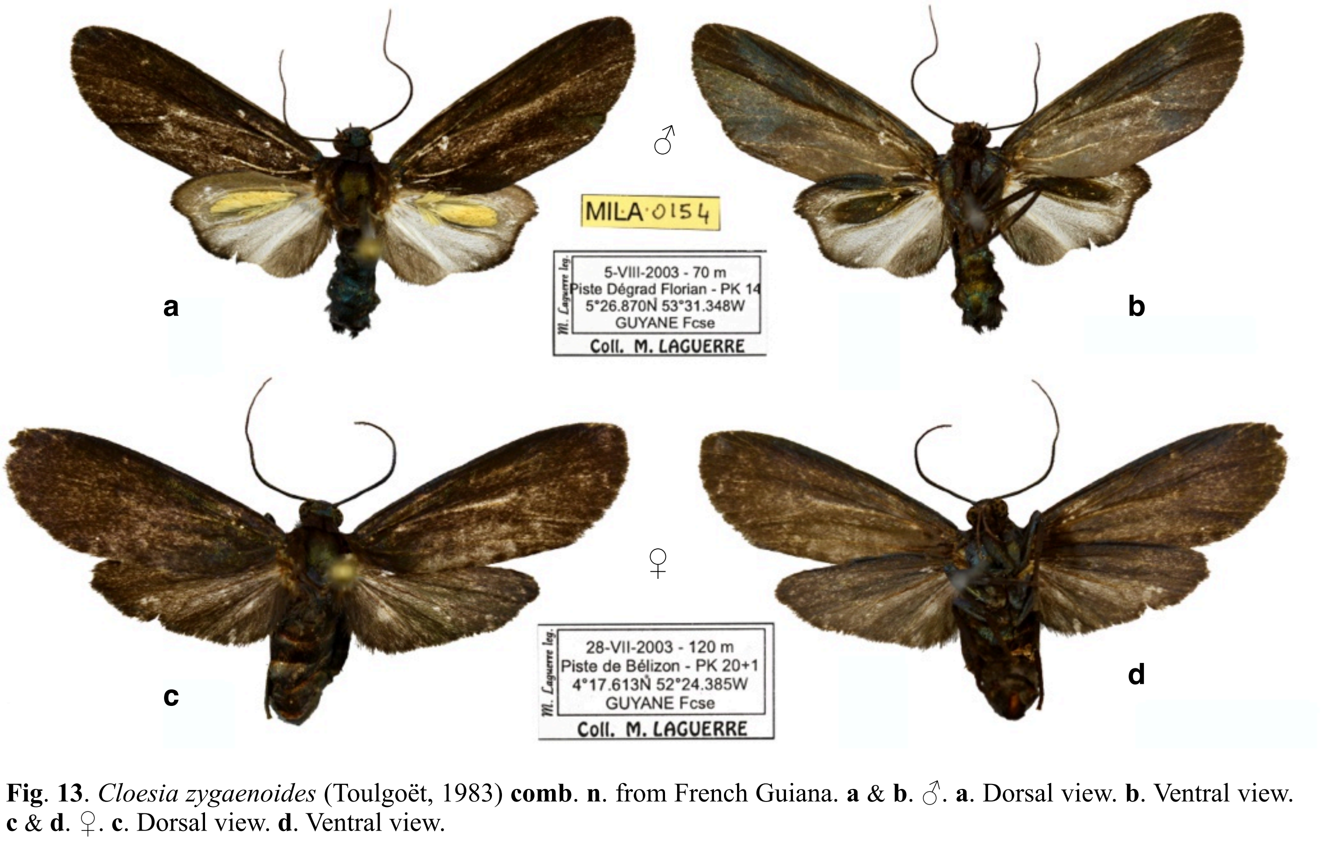

Fig. 13. *Cloesia zygaenoides* (Toulgoët, 1983) **comb. n.** from French Guiana. **a** & **b**. ♂. **a**. Dorsal view. **b**. Ventral view. **c** & **d**. ♀. **c**. Dorsal view. **d**. Ventral view.

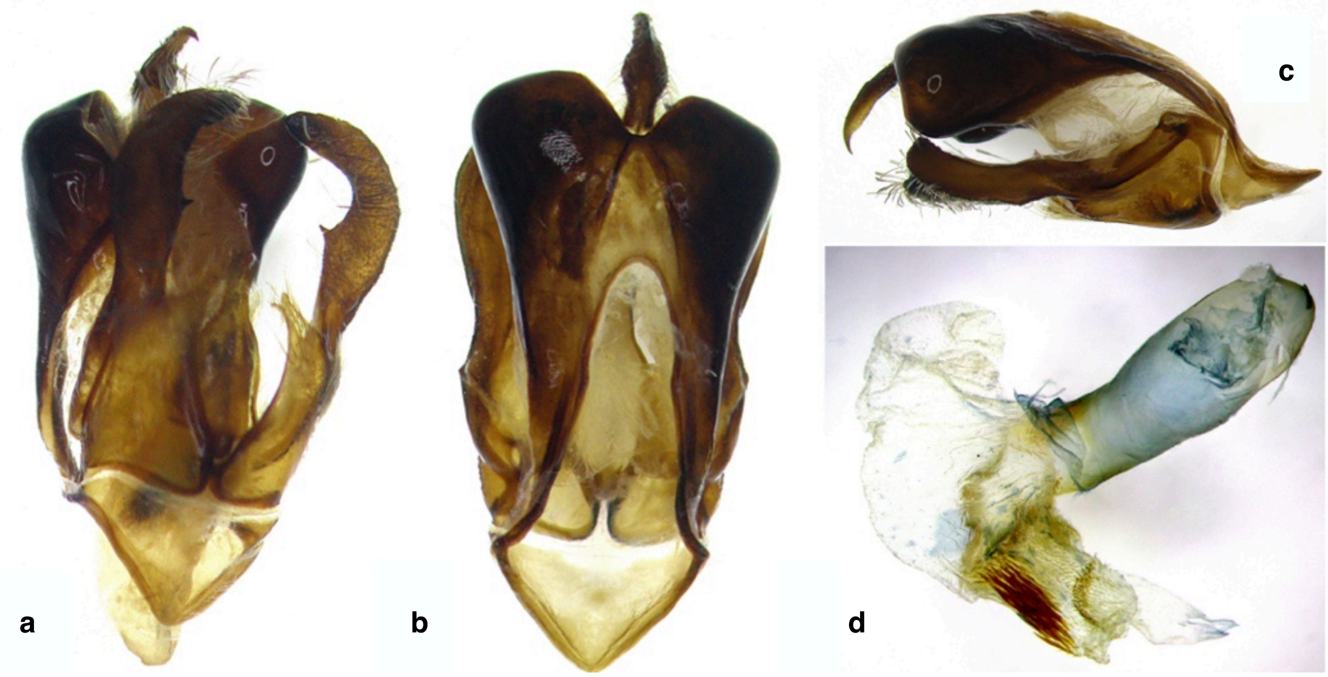

Fig. 14. *Cloesia zygaenoides* (Toulgoët, 1983) **comb. n.** from French Guiana, genitalia ♂. **a**. Ventral view. **b**. Dorsal view. **c**. Lateral view. **d**. Aedeagus with everted vesica.

III - Description of new *Cloesia* species

Cloesia imitator Laguerre **sp. n.**

BIN BOLD:ACE9511

ZooBank: http://zoobank.org/DE36C947-CE9B-4958-B35E-ED197CF2D252

Holotype, ♂, French Guiana, Piste de Kaw, PK 40 + 2, 24-VII-2003, 260 m, 4°32.535' N 52°07.485' W, M. Laguerre *leg*. Dissected Gen. ML3611 (light blue manuscript label); sequenced Process ID ARCTA153-07, BOLD ID MILA0153. Will be deposited in MNHN.

Paratypes

French Guiana

1 ♂, Piste Paul Isnard, 05-X-2015, 94 m, 5°17'02.2" N 53°58'00.4" W, M. Laguerre *leg*.

2 ♂, Piste de Kaw, PK 37 + 3.3, 31-VII-2001, 290 m, M. Laguerre *leg*., both dissected Gen. ML725 (white manuscript label) and Gen. ML711 (white manuscript label).

1 ♀, Piste de Kaw, PK38, 11-VII-2001, M. Laguerre *leg*., dissected Gen. ML3632 (light-blue manuscript label). All in MLC.

1 ♀, Summit Inselberg, Nourag[u]es, 28-I-2010, Lt: 4.09642° Ln: -52.68282°, 419 m, Carlos Lopez Vaamonde *leg*., LNOU-0382, dissected Gen. ML3630 (light-blue manuscript), sequenced Process ID LNOUB560-10, BOLD ID LNOU-0382 (yellow printed label).

In MNHN.

Bolivia

1 ♂, La Paz, Rte Caranavi - Quiquibey, environs La Cascada, 5-XI-2000, 800 m, 15°23.742' S 67°08.228' W, M. Laguerre *leg*., dissected Gen. ML753 (white manuscript label), sequenced Process ID ARCTA151-07, BOLD ID MILA0151.

1 ♂, Cochabamba, Rte Cochabamba - Villa Tunari, PK123, 10-XI-2007, 565 m, 17°03.54' S 65°368.59' W, B. Vincent *leg*.

In MLC.

Supplementary material examined

French Guiana, 1 ♀. Piste de Bélizon, PK4, 27-VII-2003, 80 m, 4°22.108' N 52°19.340 W, M. Laguerre *leg*. In MLC.

Diagnosis. – A small dark grey species. The hindwings are grey with a long and narrow androconial pouch filled with creamy white hairs. The hindwing shape is diagnostic in males. The male and female genitalia are characteristic, especially in males the transtilla processes which are longer than the juxta and strongly crenulated inward.

Male (Fig. 15a-b)

Forewing length: 12 mm. Antennae black, thin and ciliate. Head, tegulae, patagia and thorax deep black with a greenish lustre. Palpi short and black. Abdomen black with a bluish reflection. Legs black with a dull blue hue. Forewings black with a dull blue reflection especially on the internal border. Hindwings grey with a single undulation on termen followed by a short notch just before apex. Androconial pouch long and narrow, fulfilled with creamy-white hairs. Below four wings grey with a steel blue reflection on the forewings apex. The androconial pouch appears as a black oval patch.

Male genitalia (Fig. 16a-d)

Uncus long and thin with a spine directed downward. Valvae rectangular at base, then constricted in middle, terminal half well sclerotized, slightly bent inward, a blunt triangle at base, spatulate in lateral view. Vinculum evenly rounded, saccus almost absent. Juxta long, outreaching the constriction of the valvae, as a long oval abruptly narrowed at end with a strong hook directed on the left in ventral view. Transtilla arms very long, longer than juxta, bulbous at base then narrow and sharply indented internally. Aedeagus short, cylindrical, with a narrow caecum penis. A single lobed vesica, slightly curved, the extremity with a patch a small cornuti.

Female (Fig. 15c-d)

Generally duller, uniformly dark grey, with rounded hindwings devoided of androconial pouch. The hindwing termen very slightly undulated.

Female genitalia (Fig. 12a)

Papillae anales oval, apophyses long and thin. Antrum shaped as a strongly sclerotized circular plate with a deep notch medially. Ductus bursa strongly wrinkled longitudinally. Bursa copulatrix ovoid, with a rounded verrucate signum surrounded by circular wrinkles.

Etymology. – From the Latin *imitator* which means mimic, by reference to its similarity with the common *Cloesia zygaenoides* which explains also why this species remains unrecognized for such a long time.

Early stages. – Unknown.

Distribution. – Presently known from French Guiana where the species is not common and from the Amazonian foothills in Bolivian Yungas at low altitude (between 500 and 800 m). In S.E.

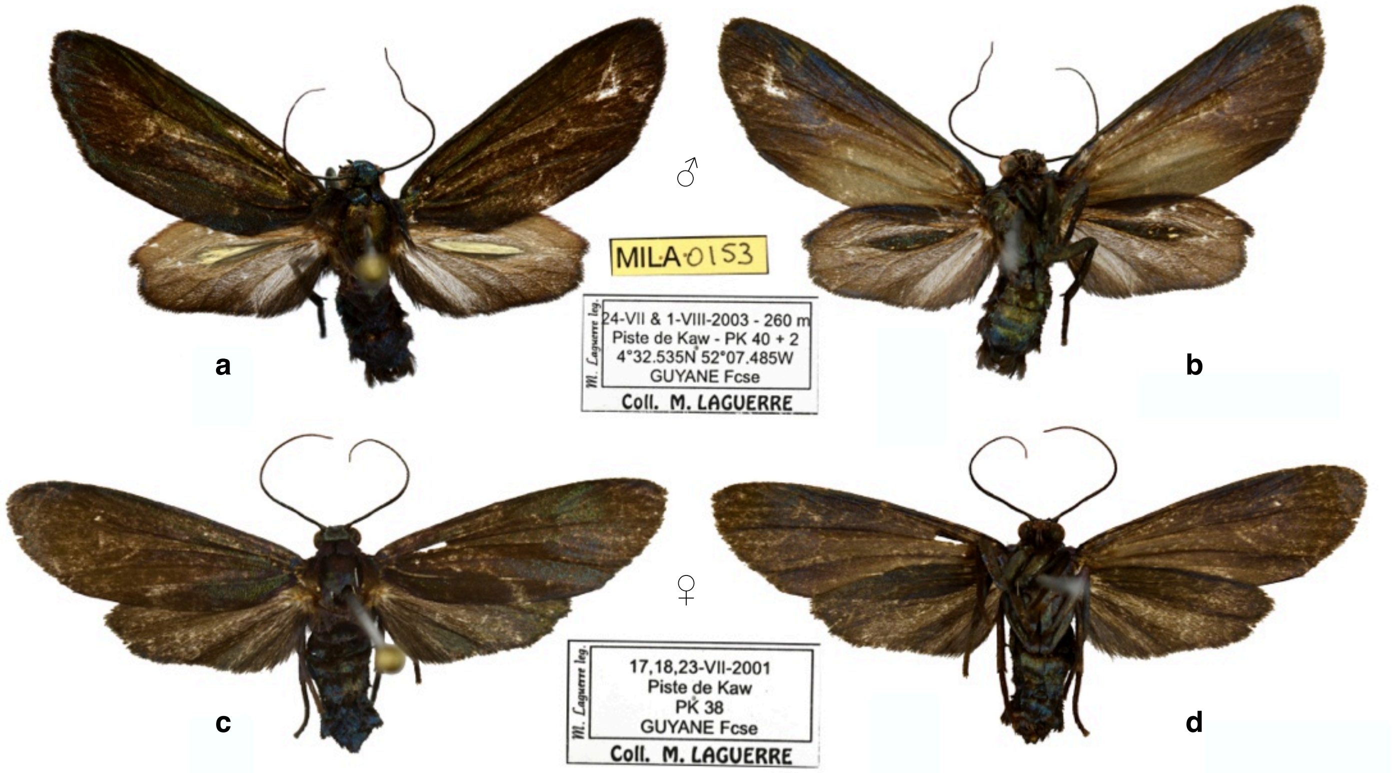

Fig. 15. *Cloesia imitator* **sp. n.** from French Guiana. **a** & **b**. Holotype ♂. **a**. Dorsal view. **b**. Ventral view. **c** & **d**. Paratype ♀. **c**. Dorsal view. **d**. Ventral view.

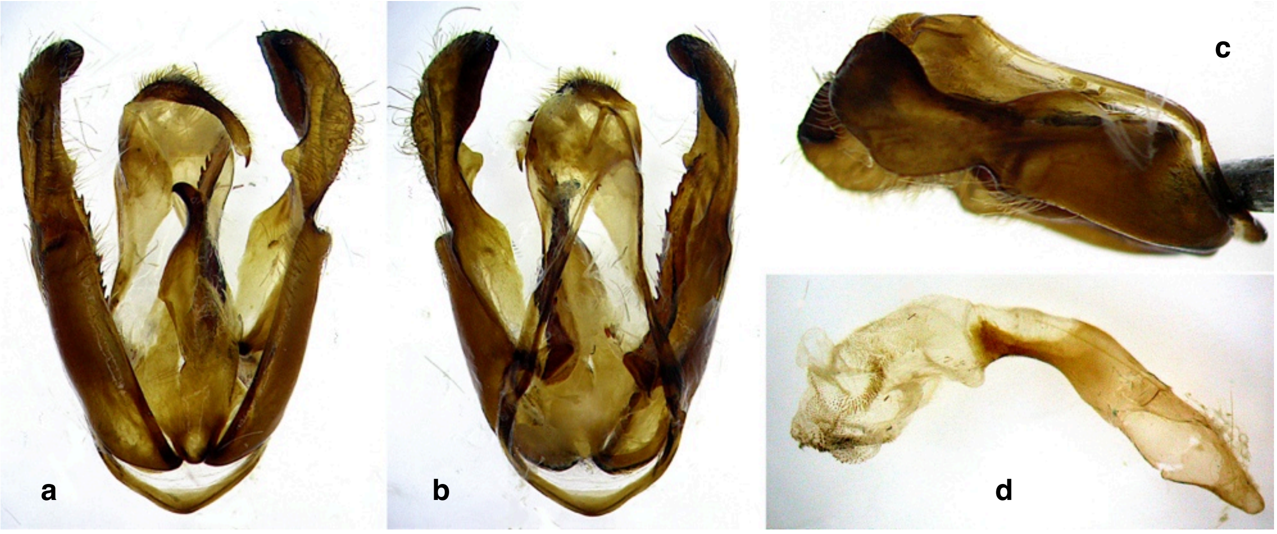

Fig. 16. *Cloesia imitator* **sp. n.** from French Guiana, genitalia ♂. **a**. Ventral view. **b**. Dorsal view. **c**. Lateral view. **d**. Aedeagus with everted vesica.

Brazil, Paraná state, in the coastal Area south of Curitiba it is possible to find an unknown entity (BIN BOLD:ACE9509) at a distance of only 1.5 %. Unfortunately, no specimen was available for study.

Cloesia andensis Laguerre **sp. n.**

BIN BOLD:AAA1385 (part)

ZooBank: http://zoobank.org/7C3ACAD5-D07E-47A5-A7E4-1AB9F970766E

Holotype, ♂, Bolivia. La Paz, Rte Caranavi - Palos Blancos, PK 38, 23-III-1984, N. Yungas, dissected Gen. ML960 (white manuscript label), in MNHN.

Paratypes

Perú

2 ♂, Cuzco, Road Pilcopata to Paucartambo, Km 39, 24-II-2009, 1782 m, -13.078000° -71.556999°, B. Vincent *leg*., Process ID ARCTD663-12, BOLD ID MILA1788 and Process ID ARCTD665-12, BOLD ID MILA1790, dissected gen. ML3617 (light blue manuscript label), in MLC.

1 ♀, Cuzco, Cosñipata, 3-IX-2016, 1950 m, -13.0999 -71.5673, D. Bolt *leg*., sequenced Process ID PEMOA839-16, BOLD ID Pe-Arc-0194, in PMJ.

Bolivia

1 ♀. La Paz, Rte Cochabamba - Villa Tunari, PK116, 19-XI-1998, 1200 m, M. Laguerre *leg*., dissected Gen. ML3631 (light-blue manuscript name), in MLC.

Diagnosis. – A dull greenish species with a metallic bluish abdomen. In males the long and narrow androconial pouch is filled with brownish-orange hairs. The female displays also a dull greenish lustre on forewings. The male genitalia are characterized by the transtilla processes which are slightly shorter than the juxta, strong and with several teeth on their extremity.

Male (Fig. 17a-b)

Forewing length: 17 mm. Antennae black, thin and ciliate. Head, tegulae and patagia black with a strong dark blue reflection. Thorax black with a golden green reflection. Palpi black. Abdomen with a dark blue suffusion. Legs black

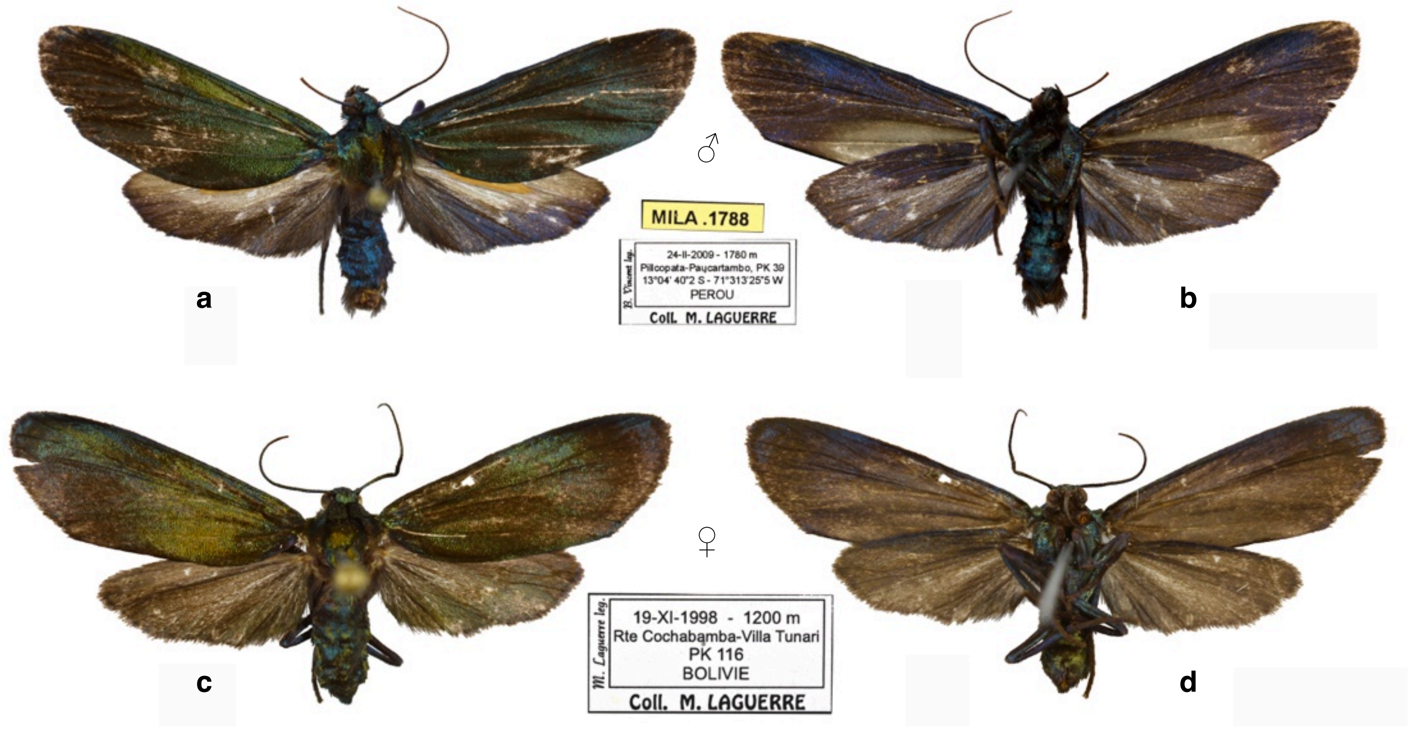

Fig. **17**. *Cloesia andensis* **sp**. **n**. – **a** & **b**. Paratype ♂ from Perú. **a**. Dorsal view. **b**. Ventral view. – **c** & **d**. Paratype ♀ from Bolivia. **c**. Dorsal view. **d**. Ventral view.

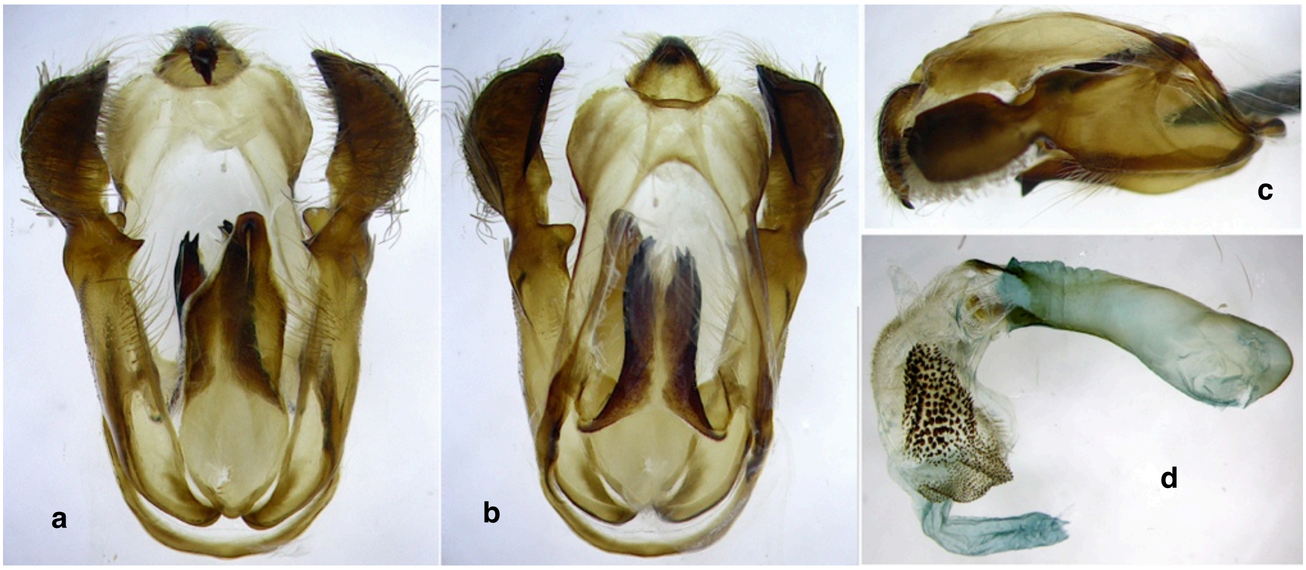

Fig. **18**. *Cloesia andensis* **sp**. **n**., genitalia ♂ from Perú. **a**. Ventral view. **b**. Vorsal view. **c**. Lateral view. **d**. Aedeagus with everted vesica.

with a strong steel blue reflection. Forewings black with a strong greenish reflection. Hindwings dark grey, lighter on disk. A single undulation on termen. Androconial pouch, long and narrow, fulfilled with brownish-orange hairs. Below dark grey with a dark blue hue on forewings costa, lighter on internal border. On hindwings the androconial pouch appears as a black oval patch.

Male genitalia (Fig. 18a-d)

Uncus slightly bend downward with a strong spine on tip. Tegumen espansions weakly sclerotized and slightly rounded. Vinculum evenly rounded, saccus almost absent. Valvae symmetrical reaching the base of uncus, basal part subrectangular, then strongly constricted after middle with two small indentations pointing inward. Terminal part spoon shaped, clearly sclerotized and laterally rectangle shaped. Juxta reaching the valvae constriction, rectangular, then abruptly narrowed as a blunt triangle. Transtilla arms reaching the tip of juxta, strongly sclerotized, bearing several spines on tip. Aedeagus cylindrical, slightly bulbous at beginning, with a short caecum penis, two sclerotized bands at the distal end. Vesica lobe perpendicular to main axis with a strong patch of cornuti, followed distally by a spiculate area.

Female (Fig. 17c-d)

Forewing length: 15 mm. Similar to male with a generally more faded coloration. The four wings dark grey, the forewings shot with a dull greenish lustre. Hindwings without undulation and androconial pouch.

Female genitalia (Fig. 12b)

Papillae anales subtriangular, apophyses long and thin, subequal. Antrum bordered with a strongly sclerotized border. Ductus bursa wide, slightly sclerotized, with some longitudinal wrinkles. Bursa copulatrix oval with a rounded verrucate signum surrounded by circular wrinkles.

Etymology. – *andensis* by reference to the distribution area including Bolivia and Peru.

Early stages. – Unknown.

Distribution. – Presently only known from the Yungas area in southern Perú and northern Bolivia at medium altitudes (between 1200 and 2000 m).

Cloesia aereus Laguerre **sp. n.**

BIN BOLD:AEB5696

ZooBank: http://zoobank.org/9683DCDC-6473-4C1A-8971-55BD0B94A920

Holotype, ♂, Espirito Santo, Reserva Augusto Ruschi, Rte S^{ta} Teresa - Fundao, 15-XI-2012, 814 m, 19.910968° S 40.533002° W, B. Vincent *leg*., dissected Gen. ML2278 (white manuscript label). Will be deposited in MZSP.

Paratype, ♂, BRAZIL, Same data as holotype, sequenced Process ID ARCTD1435-19, BOLD ID MILA2344, (yellow printed label), in MLC.

Diagnosis. – A characteristic bronzy green species. The hindwings are lighter on the disk with a long and narrow androconial pouch filled with bronzy-green hairs. The male genitalia are characteristic especially the shape of the juxta and the presence of strong expansions on tegumen at the base of uncus. The female is unknown.

Male (Fig. 19a-b)

Forewing length: 13-14 mm. Antennae black, thin and ciliate. Head, tegulae and patagia black with a bluish green lustre. Thorax black with a golden green reflection. Palpi short, thin and black. Abdomen black with a strong dark bluish-green reflection, slightly bronzy toward extremity. Legs black with a bronzy reflection. Forewings black with a bronzy green strong reflection. Hindwings grey with a thin black border. A slight undulation of termen. The androconial pouch narrow and oval, fulfilled with dark bronzy-green hairs. Below four wings grey with a strong dark blue reflection on costa and apex on forewings and costa of hindwings. On hindwings the androconial pouch appears as a black elongated oval patch.

Male genitalia (Fig. 20a-d)

Uncus long and narrow, curved ventrally with a strong spine at tip, slightly enlarged basally in ventral view. Strong expansions on tegumen shaped as a large horn in dorsal view and as a rounded paddle in lateral view. Valvae reaching the middle of uncus subrectangular in the basal half, then constricted and finally expanded in the terminal half, slightly bent inward, with a small indentation on tip in lateral view. A digitate expansion just before constriction pointing inward. Vinculum evenly curved with a small rounded saccus. Juxta reaching the constricted area of valvae, hour-glass shaped with a rounded and sclerotized extremity adorned with a strong vertical spine. Transtilla arms very short, hardly visible. Aedeagus short, bulbous at base, with a large vesica at 90°. The main lobe spiculate and with a patch of strong cornuti near end.

Female. – Unknown.

Etymology. – From the latin word *aereus* which means bronze or bronzy by reference to the general color of the forewings and of the androconial hairs.

Early stages. – Unknown.

Distribution. – Presently only known from Reserva Augusto Ruschi in Espirito Santo state, an area with a strongly endemic fauna.

Discussion. – The species is known from only two male specimens collected the same day but it appears that a second species of *Cloesia* is present in South-East Brazil. At least seven specimens (male and female) of an unknown species were collected by Maurizio Zenker in the costal area of Paraná state south of Curitiba at low altitudes (maximum 200 m). The nearest neighbour is *Cloesia imitator* at only 1.5 %, but unfortunately no specimen was available for study and the exact status of this entity is still pending.

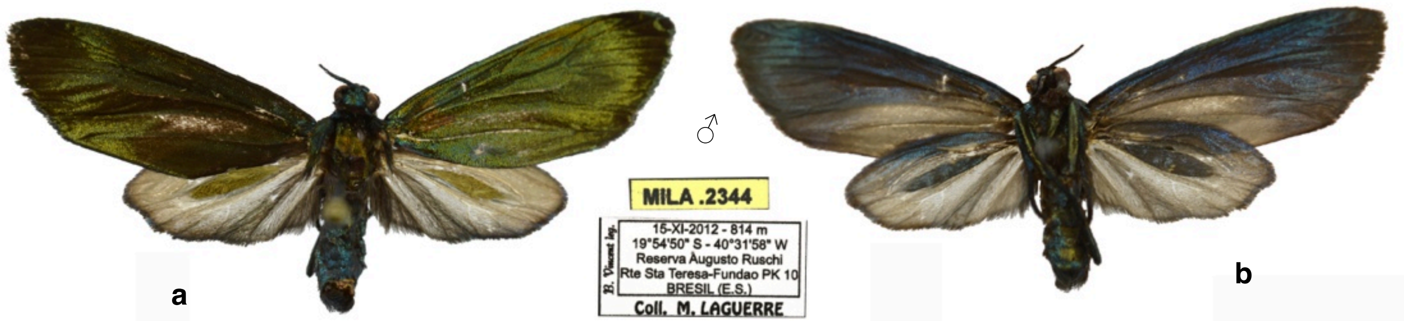

Fig. 19. *Cloesia aereus* **sp. n.** from Brazil, paratype ♂. **a**. Dorsal view. **b**. Ventral view.

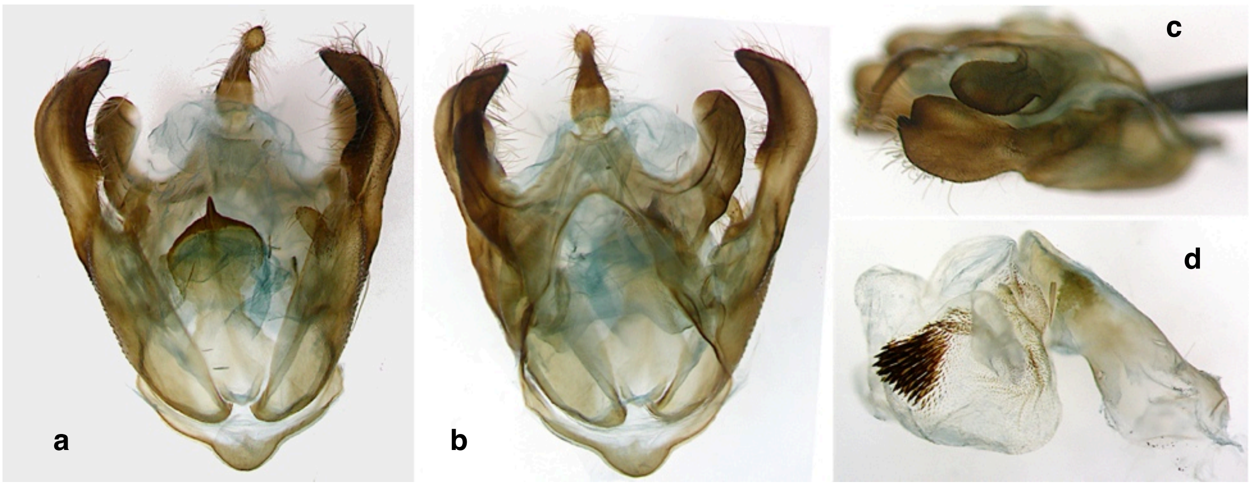

Fig. 20. *Cloesia aereus* **sp. n.** from Brazil, genitalia ♂. **a**. Ventral view. **b**. Dorsal view. **c**. Lateral view. **d**. Aedeagus with everted vesica.

Cloesia luzmariaromeroae Espinoza **sp**. **n**.

BIN BOLD:AAA1385 (in part)

ZooBank: http://zoobank.org/25857BEF-DEDA-4CE9-A390-8DB319147C3A

Holotype, ♂, INB0003456799. Rincon Nat. Pk. Guana. Prov. COSTA RICA. 900 m, Mirador, Ad. 29 Mar 1984. D.H. Janzen & W. Hallwachs. Deposited MNCR.

Paratypes

COSTA RICA

1 ♂, 21-BAES-01608. Prov. Guanacaste, Área de Conservación Guanacaste, Sector San Cristobal. Estación San Gerardo, Send. el perdido, 630 m, Col. B. Espinoza, 15-16 Marzo, 2021. 10,880009 -85,386465.

1 ♂, 21-BAES-01724. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Sendero Memo, Mirador La Loma. 774 m, Col. B. Espinoza. 05 Octubre, 2021. 10.98518, -85.42811.

1 ♂, 21-BAES-01805. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Sendero Memo, Mirador La Loma. 774 m, Col. B. Espinoza. 06 Octubre. 202110.98518, -85.42811.

1 ♂, 21-BAES-01863. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Sendero Memo, Trampa Nacho. 774 m, Col. B. Espinoza, 06 Octubre, 2021. 10.98518, -85.42811. (Deposited BioAlfa).

1 ♂, 06-SRNP-101878. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Estación Pitilla. 675 m, Col. S. Ríos & H. Cambronero. 2/28/2006. 10.989, -85.426.

1 ♂, 07-SRNP-109545. Prov. Guanacaste, Área de Conservación Guanacaste, Sector del Oro, Sendero Manta, 610 m, Col. H. Cambronero & R. Franco. 11/7/2007. 10.997, -85.457.

1 ♂, 07-SRNP-109546. Prov. Guanacaste, Área de Conservación Guanacaste, Sector del Oro, Sendero Manta, 610 m, Col. H. Cambronero & R. Franco. 11/7/2007. 10.99689, -85.45679.

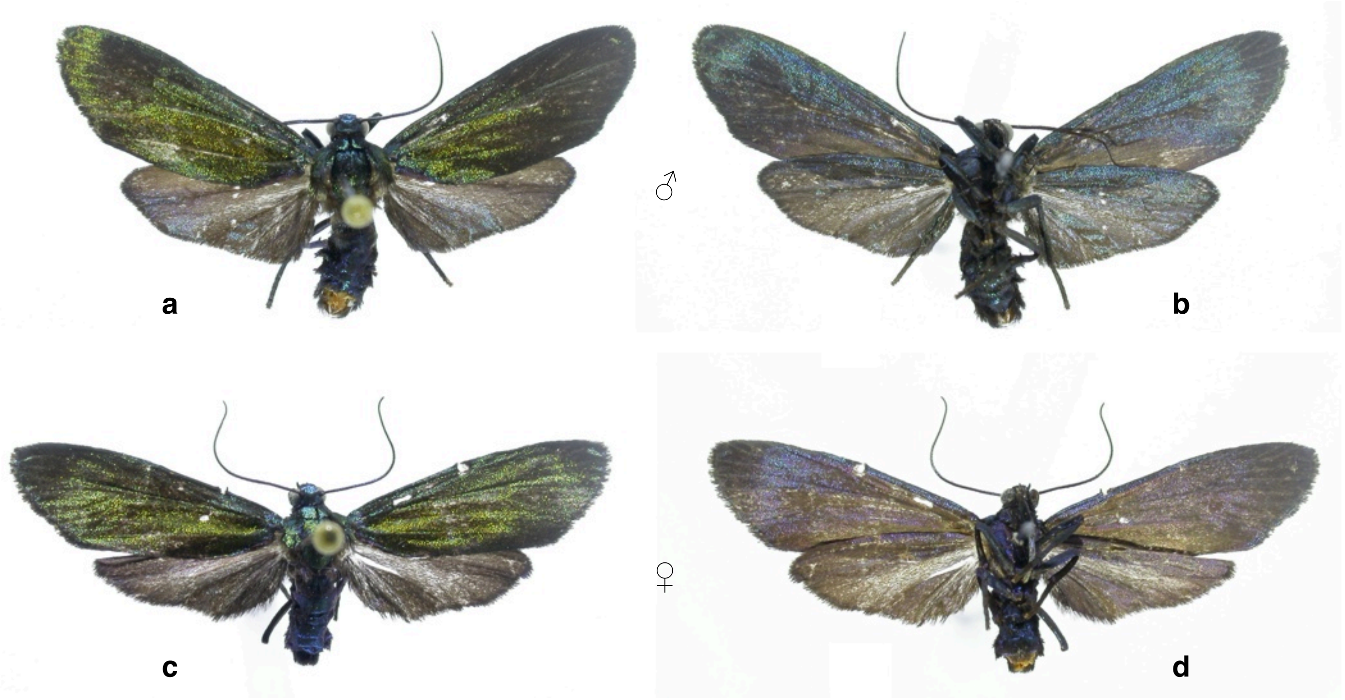

Fig. **21**. *Cloesia luzmariaromeroae* **sp**. **n**. from Costa Rica. **a** & **b**. Holotype ♂ (INB0003456799). **a**. Dorsal view. **b**. Ventral view. **c** & **d**. Paratype ♀ (INB0003450598). **c**. Dorsal view. **d**. Ventral view.

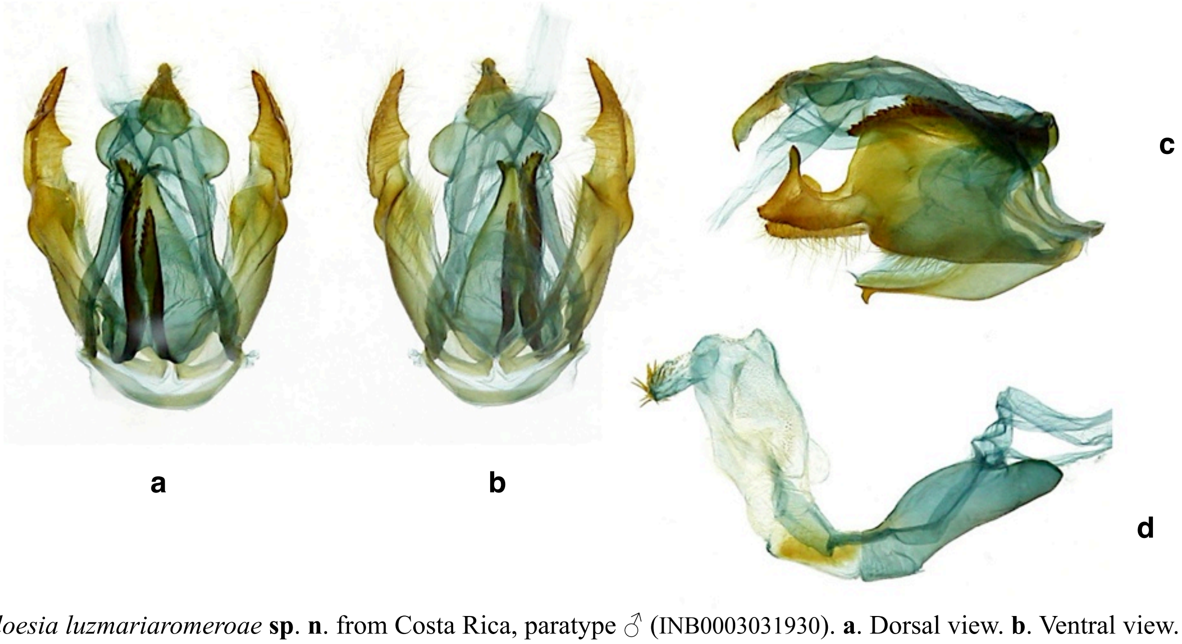

Fig. **22**. *Cloesia luzmariaromeroae* **sp**. **n**. from Costa Rica, paratype ♂ (INB0003031930). **a**. Dorsal view. **b**. Ventral view. **c**. Lateral view. **d**. Aedeagus with everted vesica.

1 ♂, 07-SRNP-100401. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Estación Pitilla. 675 m, Col. R. Franco & F. Quesada. 2/11/2007. 10.98931, -85.42581.

1 ♂, 07-SRNP-110792. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Estación Caribe, 376 m, Col. F. Quesada & R. Franco. 11/10/2007. 10.90370, -85.28787.

1 ♂, 09-SRNP-103731. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Albergue Oscar, Manta Trocha, 719 m, H. Cambronero & F. Quesada. 3/26/2009. 10.86623, -85.32693.

1 ♂, 10-SRNP-106010. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Albergue Oscar, Tunel, 708 m, S. Ríos & F. Quesada, 2/15/2010. 10.86835, -85.32711.

1 ♂, 11-SRNP-100794. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Santa María, Estación Santa María, 832 m, H. Cambronero & R. Franco. 2/4/2011. 10.7646, -85.30321.

1 ♂, INBI0003319478. Prov. Alajuela, Upala, Bijagua, Albergue Heliconias, 700m, 19 Nov – 2 Dec 2000, G. Rodríguez, de Luz, L_N_299800_423800. #62920.

1 ♂, INB0003506243. Prov. San José, Pk. Nac. Braulio Carrillo, Estación Carrillo, 700 m, July 1984. Coll I. A. Chacón.

1 ♂, INB0003031930, (Dissected). Prov. Alajuela. A.C.C.V.C. Central, Sarapiquí, Virgen del Socorro. 800 – 1000 m, 6 FEB 1987. I. A. Chacón. L_N_248800_517500. #52539.

1 ♂, INB0003408834. Guanacaste Prov., Estación Mengo, 1100 m, SW side Volcán Cacao, Mar 1988. D.H. Janzen & W. Hallwachs.

1 ♂, INBIOCRI001768941. Prov. Alajuela, Est, San Ramón Oeste, 620 m, 3-9 Abr 1994. C. Cano. L_N_318100_381900. #2818.

1 ♂, INB0003513181. Alajuela Prov. Finca San Gabriel, 650 m, (16Km ENE Queb. Grande), DHJanzen & WHallwachs. 8 Feb 1988.

1 ♀, 06-SRNP-109245, (Dissected). Prov. Guanacaste, Área de Conservación Guanacaste, Sector San Cristobal, Estación San Gerardo, 575 m, Col. F. Quesada & H. Cambronero. 11/21/2006. 10.88009, -85.38887.

1 ♀, 10-SRNP-115534. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Santa María, Estación Santa María, 832 m, F. Quesada & S. Ríos. 11/5/2010. 10.7646, -85.30321.

1 ♀, INB0003510354. Prov. San José, Pk. Nac. Braulio Carrillo, Est. Carrillo, 700m., Mar 1985. Coll. I. A. Chacón.

1 ♀, INB0003456794. Guanacaste. Prov., Rincón Nat. Pk., Mirador, Ad., 900 m, 29 Mar 1984. D.H. Janzen & W. Hallwachs.

1 ♀, INB0003031849. Prov. Alajuela, A.C.C.V.C., Central, Sarapiquí, Virgen del Socorro. 800-1000 m, 6 FEB 1987. I. A. Chacón. De Luz. L_N248800_517500. #52539.

1 ♀, INB0003455896, (Dissected). Alajuela Prov., Finca San Gabriel, 650 m, (16km ENE Quebrada Grande), 11 NOV 1983. D. Janzen, W. Hallwachs.

1 ♀, INB0003450598. Alajuela Prov., Finca San Gabriel, 630 m, 15km E. Quebrada Grande, 8 Feb 1983. D.H. Janzen and W. Hallwachs.

Deposited MNCR.

COSTA RICA

3 ♂, Alajuela, Refugio Bosque Alegre, 3-V-2005, 1000 m, B. Vincent *leg*., one ♂ is dissected Gen. ML944 (white manuscript label) and one ♂ is sequenced Process ID ARCTA149-07, BOLD ID MILA 0145.

Deposited MLC.

Diagnosis. – This species is characterized by the lack of androconial organs on the abdomen and on hindwing. It is also similar to *Cloesia mariamartachavarriae*, but the adult body is slightly smaller in size and a little less robust than in *Cloesia mariamartachavarriae*. Also, *Cloesia luzmariaromeroae* is less brilliant than *Cloesia mariamartachavarriae*.

Male (Fig. 21a-b). INBIOCRI001768941

Forewing length 13.8-15.0 mm (n = 14). Head, thorax and abdomen dark metallic greenish-blue. Labial palp short, upturned, basal and middle segment with elongate scales. Antenna filiform, with metallic blue scales dorsally, brown ventrally. Legs dark metallic blue. Forewing dark metallic yellowish-green. Hindwing dark brown, suffused with dark metallic blue, costal margin light brown. Ventrally, both wings dark brown suffused with brilliant metallic blue. Androconial pouch on hindwing absent. Abdomen dark metallic blue dorsally and ventrally, with a purple iridescence. Coxae and legs dark brown suffused with metallic blue.

Male genitalia (Fig. 22a-d). INB0003031930

Uncus short, broad basally, thin distally, slightly covered by long bristles, with a very short and pointed tip, horn-like, curved downward ventrally. Tegumen elongate, slightly sclerotized, with two lateral rounded projections. Valvae slightly asymmetrical at the tip, sclerotized, very broad on the basal half and rectangular-shaped, distal half formed by an elongate and thin sclerotized process, pointed at the tip and with a short and flattened projection arising dorsally, ventral margin with long bristles and a very small pointed projection arising inward on interior surface. Transtilla with two elongate projections, strongly sclerotized, covered by short and thick spines dorsally on the distal half, right projection much longer than left projection and slightly curved outward distally. Juxta sclerotized, elongate, slightly longer than basal half of

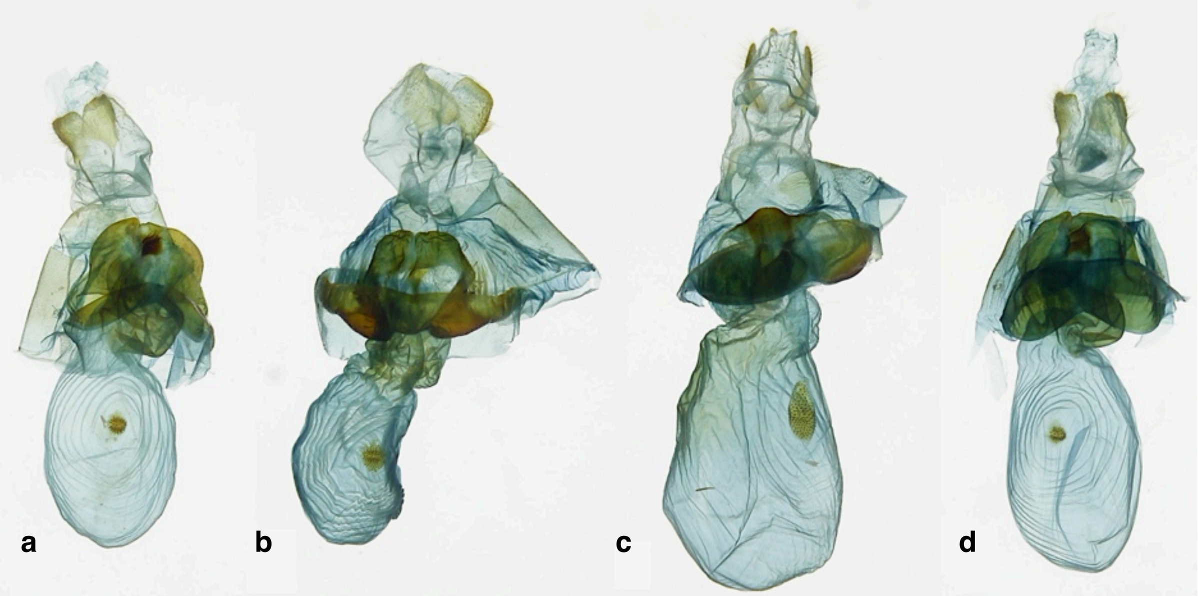

Fig. 23. Genitalia ♀ of *Cloesia* species from Central America. **a**. *Cloesia digna* Schaus, 1911 from Costa Rica (INBIOCRI000641706). **b**. *Cloesia luzmariaromeroae* **sp**. **n**. from Costa Rica (INB0003455896). **c**. *Cloesia mariamartachavarriae* **sp**. **n**. from Costa Rica (INB0003311758). **d**. *Cloesia parthia* (Druce, 1889) from Costa Rica (INBIOCRI000003287).

valva, convex, with a pointed tip and a small sclerotized horn-shaped process arising ventrally. Saccus absent. Aedeagus elongate, slightly sclerotized, anterior half wider than posterior half, posterior half curved upward dorsally. Vesica short, membranous, arising upward dorsally, with a basal short and rounded lobe on the anterior surface; a short elongate-shaped lobe distally arising on postero-lateral surface, covered by thick and strongly sclerotized spines on its distal portion; a large light brown spinulate patch medially on the left side of vesica, with spinules that decrease in size distally.

Female (Fig. 21c-d)

Forewing length 14.2-15.8mm (n = 6). No sexual dimorphism is present.

Female genitalia (Fig. 23b). INB0003455896

Papilla analis slightly sclerotized, square-shaped, very scarcely covered by elongate bristles near the anterior margin. A patch of short bristles dorso-laterally on the anterior portion. Posterior apophysis slightly shorter than anterior apophysis. Segments IX+X arising upward dorsally, exposing papilla analis dorsally in natural position. Segment VIII strongly reduced in size compared with segment VII. Sternum VII strongly modified, strongly striate laterally. Ostium bursae surrounded by a large, prominent, slightly sclerotized structure, composed by the lamella postvaginalis, that arise posteriorly and with a rugose posterior surface. Lamella antevaginalis expanded laterally, concave-shaped, strongly sclerotized and striated laterally. Antrum + ductus bursae very short, membranous and wrinkled. Corpus bursae elongated, beanlike, strongly striated, very slightly sclerotized basally and with a rugose brain-shaped surface. A small concave signum ventrally, covered by tiny thick spines on its interior surface. A thick, wrinkled lobe arising basally and ventro-laterally, which join the ductus seminalis with corpus bursae.

Etymology. – *Cloesia luzmariaromeroae* **sp**. **n**. is named in honor of Sra. Luz Maria Romero of Liberia and Área de Conservación Guanacaste (ACG), Guanacaste Province, Costa Rica, in recognition of her decades of intensively dedicated development of the ACG Programa de Educación Biológica (PEB) and her follow-on on-going co-management and tutorial of the ACG Parataxonomist Program.

Early stages. – Unknown.

Distribution. – *Cloesia luzmariaromeroae* **sp**. **n**. is a widespread distributed species and is found from 450 to 1200 m elevation, along the Caribbean slope of Costa Rica, but much more abundant to the northern Caribbean area of the country.

Cloesia mariamartachavarriae Espinoza **sp**. **n**.

BIN BOLD:AAA1385 (in part)

ZooBank: http://zoobank.org/55A20747-627F-4490-8D7F-6C82E641AE69

Holotype, ♂, INB0003450599. Finca San Gabriel, 630 m, 15 km E. Quebrada Grande, Alajuela Prov. Costa Rica, 8 Feb 1983. D.H. Janzen and W. Hallwachs. Deposited MNCR.

Paratypes

COSTA RICA

1 ♂, 21-BAES-01807. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Sendero Memo, Mirador La Loma, 774 m, Col. B. Espinoza. 06 Octubre, 2021. 10.98518, -85.42811.

1 ♂, 21-BAES-01864. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Sendero Memo, Trampa Nacho, 774 m, Col. B. Espinoza. 06 Octubre, 2021. 10.98518, -85.42811.

1 ♂, 21-BAES-01908. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Sendero Memo, Mirador La Loma, 774 m Col. B. Espinoza. 07 Octubre, 2021. 10.98518, -85.42811. (Deposited BioAlfa).

1 ♂, 07-SRNP-100529. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Est. Pitilla, 675 m, F. Quesada & S. Ríos. 2/16/2007. 10.98931, -85.42581.

1 ♂, 07-SRNP-109547. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Del Oro, Sendero Manta, 610 m, H. Cambronero & R. Franco. 11/7/2007. 10.99689, -85.45679.

1 ♂, 07-SRNP-110792. Costa Rica, Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Estación Caribe, 376 m, F. Quesada & R. Franco. 11/10/2007. 10.90370, -85.28787.

1 ♂, 08-SRNP-102076. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Del Oro, Sendero Manta, 610 m, H. Cambronero & R. Franco. 6/4/2008. 10.99689, -85.45679.

1 ♂, 08-SRNP-102077. Prov. Guanacaste, Area de Conservación Guanacaste, Sector Del Oro, Sendero Manta, 610 m, H. Cambronero & R. Franco. 6/4/2008. 10.99689, -85.45679.

1 ♂, 09-SRNP-108325. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Casa Leiva, 454 m, F. Quesada & R. Franco. 9/17/2009. 10.94314, -85.31808.

1 ♂, 09-SRNP-101111. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Río Francia, 410 m, R. Franco & S. Ríos. 1/25/2009. 10.90425, -85.2865.

1 ♂, 09-SRNP-110394. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Del Oro, Serrano, 585 m, R. Franco & S. Ríos. 11/15/2009. 11.00023, -85.45621.

1 ♂, 10-SRNP-107020. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Manta Hugo, 491 m, H. Cambronero & R. Franco. 3/14/2009. 10.88110, -85.26770.

1 ♂, INB0003433835. Prov. Cartago, Turrialba, P. N. Barbilla, Estación Barbilla, 500 m, FEB 2002, L. Chavarría. Trampa de Luz. L_N_218279_596387. #66975.

1 ♂, INB0003456396. Fca La Campana, El Ensayo, 7km NW Dos Ríos, Alajuela Prov. COSTA RICA. 700 m, 15-17 Mar 1986. DH Janzen & W. Hallwachs.

1 ♂, INB0003456788. Guanacaste Prov. Rincón Nat. Pk., Mirador, Ad., 900 m, 29 Mar 1984. DH Janzen & W. Hallwachs.

1 ♂, INB0004265123. Prov. Cartago, Turrialba. Z. P. Río Tuís, Finca Quijote, Propietario Sr. Phillip E. Hacicock, 859 m, 20-21 OCT 2010. B. Hernández, M. Moraga. Tr. De Luz Mercurio. L_N_197807_576097. #99997.

1 ♂, INBIOCRI001076795. Guanacaste Prov., Estac. Pitilla, 700 m, 9km S. Santa Cecilia, Mar 1989. GNP Biodiversity Survey. W85 25 25' 40", N10 59' 26".

1 ♂, INBIOCRI001869466. Prov. Guanacaste, P.N. Guanacaste, Estac. Pitilla, 9km S. Sta Cecilia, 700 m, 19-23 Jun 1993, C. Moraga. L_N_330200_380200. #2897.

1 ♂, INBIOCRI002168620, (Dissected). Prov. Guanacaste, Estación Pitilla, 9 km S. de Santa Cecilia, 700 m, 4-23 ABR 1995. E. Alfaro, L_N_329950_380450. #4602.

1 ♀, 21-BAES-01725. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Sendero Memo, Mirador La Loma, 774 m, Col. B. Espinoza, 05 Octubre 2021. 10.98518, -85.42811.

1 ♀, 21-BAES-01869. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Estación Pitilla. 675 m, Col. B. Espinoza, 07 Octubre, 2021. 10.98931, -85.42581.

1 ♀, 21-BAES-01910. Costa Rica, Guanacaste, Área de Conservación Guanacaste, Sector Pitilla, Sendero Memo, Mirador La Loma. 774 m, Col. B. Espinoza. 07 Octubre 2021. 10.98518, -85.42811.

1 ♀, 06-SRNP-109483. Prov. Guanacaste, Área de Conservación Guanacaste, Sector San Cristobal, Estación San Gerardo, 575 m, R. Franco & S. Ríos, 11/22/2006. 10.88009, -85.38887.

1 ♀, 07-SRNP-109953, (Dissected). Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Estación Caribe (melina), 391 m, F. Quesada & R. Franco, 11/9/2007. 10.89560, -85.29558.

1 ♀, 09-SRNP-103656. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Albergue Oscar, Manta Trocha, 719 m, H. Cambronero & F. Quesada, 3/26/2009. 10.86623, -85.32693.

1 ♀, 09-SRNP-103730. Prov. Guanacaste, Área de Conservación Guanacaste, Sector Rincón Rain Forest, Albergue Oscar, Manta Trocha, 719 m, H. Cambronero & F. Quesada, 3/26/2009. 10.86623, -85.32693.

1 ♀, INB0003042967. Prov. Limón, Res. Biol. Hitoy Cerere, Est. Hitoy Cerere, Send. Bobócara. 600-700 m, 15-17 May 1999, R. Barton. de Luz. L_N_184800_639600. #53758.

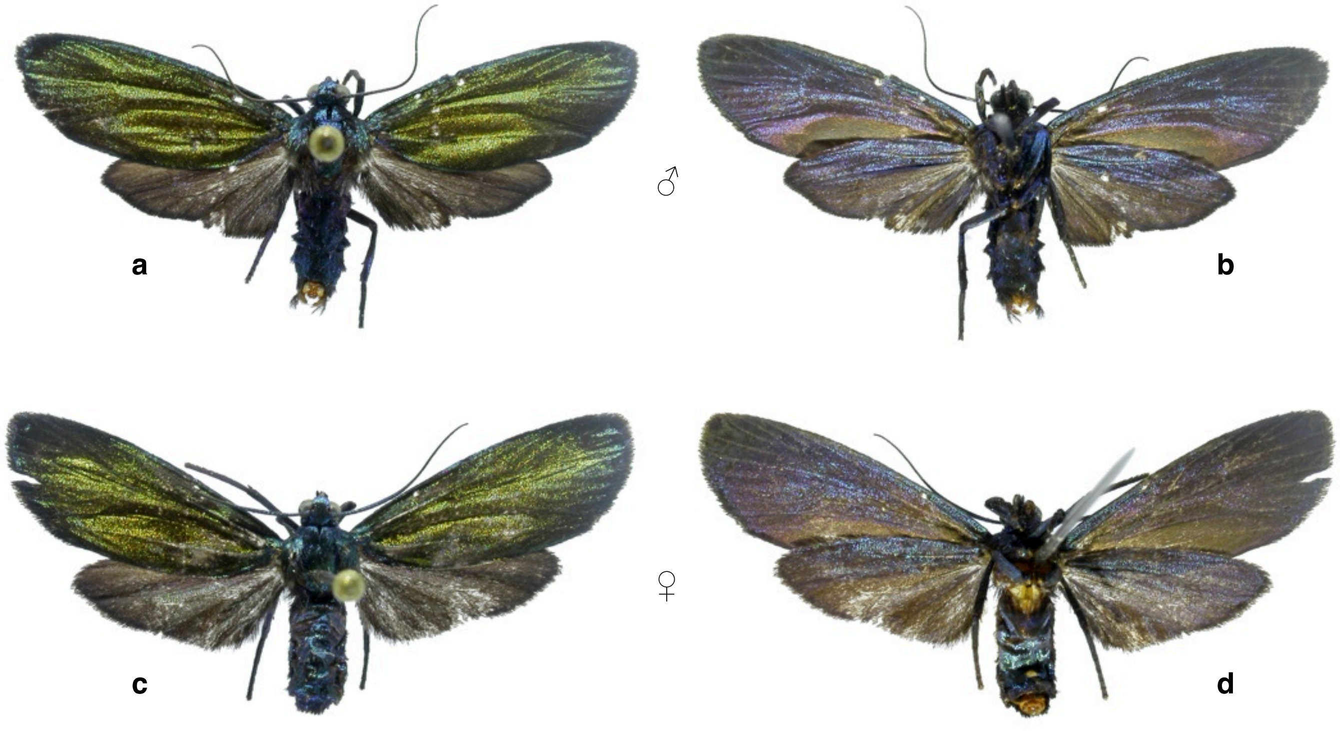

Fig. 24. *Cloesia mariamartachavarriae* **sp. n.** from Costa Rica. **a** & **b**. Holotype ♂ (INB0003450599). **a**. Dorsal view. **b**. Ventral view. **c** & **d**. Paratype ♀ (INB0003455088). **c**. Dorsal view. **d**. Ventral view.

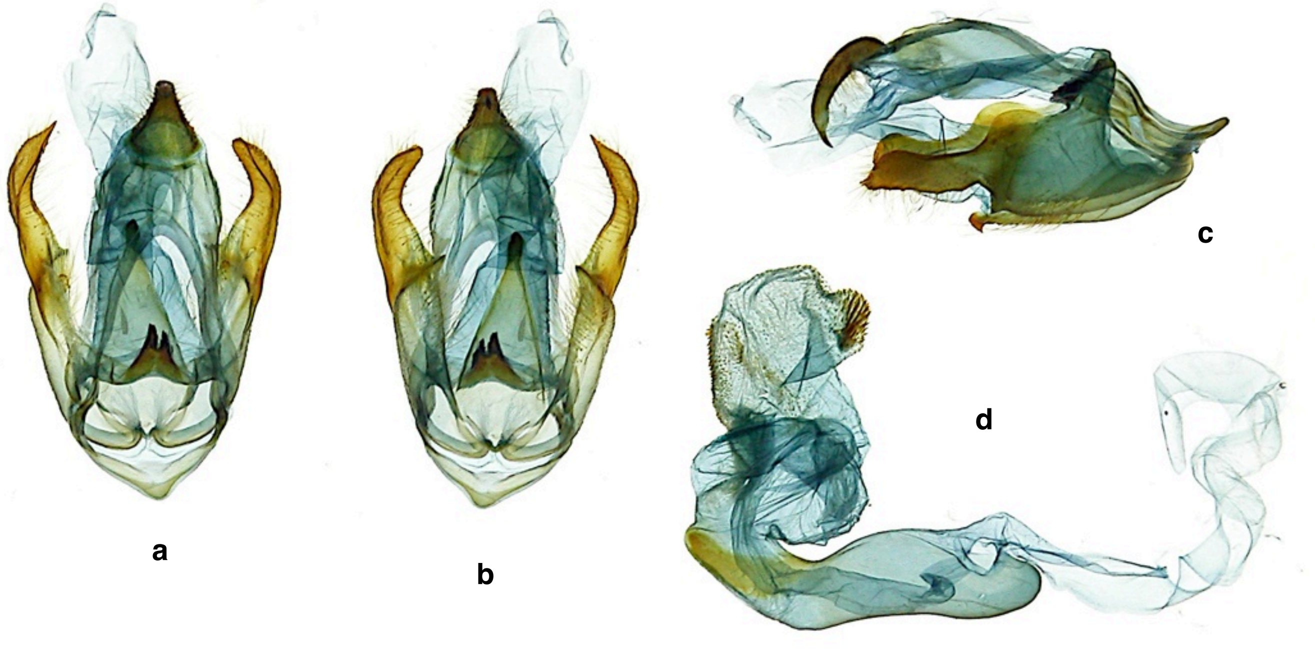

Fig. 25. *Cloesia mariamartachavarriae* **sp. n.** from Costa Rica, paratype ♂ (INBIOCRI002168620). **a**. Dorsal view. **b**. Ventral view. **c**. Lateral view. **d**. Aedeagus with everted vesica.

1 ♀, INB0003311758, (Dissected). COSTA RICA, Prov. Limón, Pococí, Finca Bque Lluvioso, INBio, 300 m, 26-29 SET 2000. M. Moraga. de Luz. L_N_551770_241740. #59104.

1 ♀, INB0003455088. Finca San Gabriel. Alajuela. Prov. COSTA RICA, 650 m, (16 Km ENE Queb. Grande), DH Janzen & W. Hallwachs. 9 Mar 1984.

1 ♀, INBIOCRI001869491. Prov. Guanacaste, P.N. Guanacaste, 9 Km S. Sta. Cecilia, 700 m, Calixto Moraga, 19-23 Jun1993. L_N_3320200_380200. #2897.

Deposited MNCR.

COSTA RICA

5 ♂ **1** ♀, Cartago, Reserva de Copal, 10-V-2010, 1060 m, 09°47.050' N 83°45.089' W, M. Laguerre *leg*., one ♂ is dissected Gen. ML2100 (white manuscript label).

2 ♂, Limón, Reserva Veragua, 12-V-2010, 355 m, 09°55.285' N 83°12.105' W, M. Laguerre *leg*., one ♂ is dissected Gen. ML2101 (white manuscript label) and sequenced Process ID ARCTD666-12, BOLD ID MILA 1791, (yellow printed label).

2 ♂, Cartago, Parc Braullio Carillo, Quebrada González, 10-V-2005, 600 m, B. Vincent leg., one ♂ is dissected Gen. ML943 (white manuscript label), one ♂ is sequenced Process ID ARCTA150-07, BOLD ID MILA 0150.

Deposited MLC.

NICARAGUA

3 ♂, Río San Juan, Réserve de Bartola, 4 au 8-VIII-2000, 200 m, M. Laguerre *leg*., one ♂ is dissected Gen ML. 737 (white manucript label).

Deposited MLC.

COLOMBIA

1 ♂, Valle del Cauca, Buenaventura, Reserva Natural Pericos, 19-XI-2017, 390 m, 3.848° N 76.787° W, C González, J. Díaz, R. Rougerie, T. Decaens *leg*., IAvH-E-200768, the ♂ is dissected Gen. ML3672 (light-blue manuscript label) and dissected Process ID ARCTD1493-20, BOLD ID MILA 2402. Deposited MLC.

Diagnosis. – This species is easy to distinguish by the remarkable metallic golden-green background color on forewing, combined with the metallic blue-greenish on inner, outer and distal margin of the wing, as well as the presence of androconial organs laterally on the seventh abdominal segment and the absence of an androconial pouch on hindwing.

Male (Fig. 24a-b). INB0004265123

Forewing length 13.7-16.1 mm (n = 17). Head and thorax metallic blue-greenish. Labial palp short, upturned, basal and middle segment with elongate scales. Antenna filiform, dark metallic blue above and dark brown below. Abdomen dark metallic purplish-blue. Coxae and legs dark metallic blue. Forewing metallic golden-green, inner, outer and distal margin metallic blue-greenish, ventrally dark brown suffused with brilliant metallic blue. Hindwing dark brown suffused with brilliant metallic blue dorsally and ventrally.

Male genitalia (Fig. 25a-d). INBIOCRI002168620

Uncus slightly elongated, strongly sclerotized, wider basally, slightly curved downward ventrally, pointed at the tip and moderately covered by long bristles laterally and ventrally. Tegumen elongated, very slightly sclerotized. Valvae very broad on the basal half, rectangular-shaped, and slightly sclerotized; distal half elongated, sclerotized, curved inward and asymmetrical, with the distal portion of left valva pointed at the tip and distal portion of the right valva rounded at the tip; ventral margin of valvae covered by long bristles, except basally and with a pointed short projection on the middle portion; dorsal margin flattened toward the tip and curved inward. A small lobulated intrasaccular process, near the middle of the valvae, bearing long bristles. Transtilla with two heavily sclerotized short process, dorsally covered with thick spines. Juxta sclerotized, elongated, broad basally and pointed distally, with a very small pointed process, horn-shaped arising ventrally. Saccus minute. Aedeagus thick, slightly sclerotized, slightly curved upward dorsally on its posterior portion. Vesica elongated, arising upward dorsally and to the left side, with a patch of thick spines distally on dorsal surface, a second large patch of strong and tiny spines medially on ventral surface and a third light brown basal patch of slightly elongate bristles on ventral surface. Androconial organ on segment VII, sack-shaped, inverted, densely covered by elongate light brown scales and a patch of very long hairs.

Female (Fig. 24c-d)

Forewing length 14.7-15.5 mm (n = 8). No sexual dimorphism is present.

Female genitalia (Fig. 23c). INB000331758

Papilla analis slightly sclerotized, rectangular-shaped, scarcely covered by elongate bristles and with a patch of short bristles on the anterior portion. Posterior and anterior apophyses the same length. Segments IX+X arising upward dorsally, exposing papilla analis dorsally in natural position. Segment VIII reduced in size compared with segment VII. Sternum VII strongly modified. Ostium bursae surrounded by a prominent sclerotized structure, composed by the lamella postvaginalis, somewhat extends laterally. Lamella antevaginalis sclerotized, concave-shaped and expanded laterally. Antrum slightly sclerotized. Ductus bursae very short, thick and wrinkled. Corpus bursae large, lobule-shaped, striate, with a brain-shaped surface basally, a very slight sclerotization, irregular shape basally on dorsal surface, a medium size oval signum, concave, and covered by tiny thick spines on its interior surface. A thick, elongated lobe, oval-shaped, arising basally on ventral surface, which join the ductus seminalis with corpus bursae.

Etymology. – *Cloesia mariamartachavarriae* **sp**. **n**. is named in honor of Sra. Maria Marta Chavarria of San Jose and Área de Conservación Guanacaste (ACG), Guanacaste Province, Costa Rica, in recognition of her decades of intensively dedicated development of the foundation of Costa Rica’s Instituto Nacional de Biodiversidad (INBio), the ACG Parataxonomist Program, and now the co-coordination of the ACG Programa de Investigación and mangrove forest restoration.

Early stages. – Unknown.

Distribution. – *Cloesia mariamartachavarriae* **sp**. **n**. is a lowlands species, only recorded from the Pacific slope of Costa Rica, from 300 to 900 m elevation, very abundant in the northern area, in Guanacaste rainforest and scarcely collected in the southern part of the country. One unique specimen collected in Valle del Cauca, Colombia has identical genitalia and sequence and is considered as conspecific.

Conclusion

Following this study the genus *Cloesia* contains now ten species instead a historical number of three, but the situation may change quickly as several new species are suspected especially in Latin America. Besides the unnamed species in Paraná State in Brazil (BOLD:ACE9509), there are in the provided tree (fig. 1) two identical sequences from southern Ecuador (BOLD:AAA1385) which align with nothing else. Unfortunately, no specimen was available for study, but we have dissected a single specimen collected in eastern Ecuador (Fig. 26) with male genitalia different from anything else and which is maybe the same entity. Nevertheless, in the absence of one sequence in one hand and male genitalia in the other hand we are unable to conclude and presently we leave this problem open until more available data.

Finally, large parts of Latin America but also Central America are devoid of any data and very likely much more species will be found in these areas.

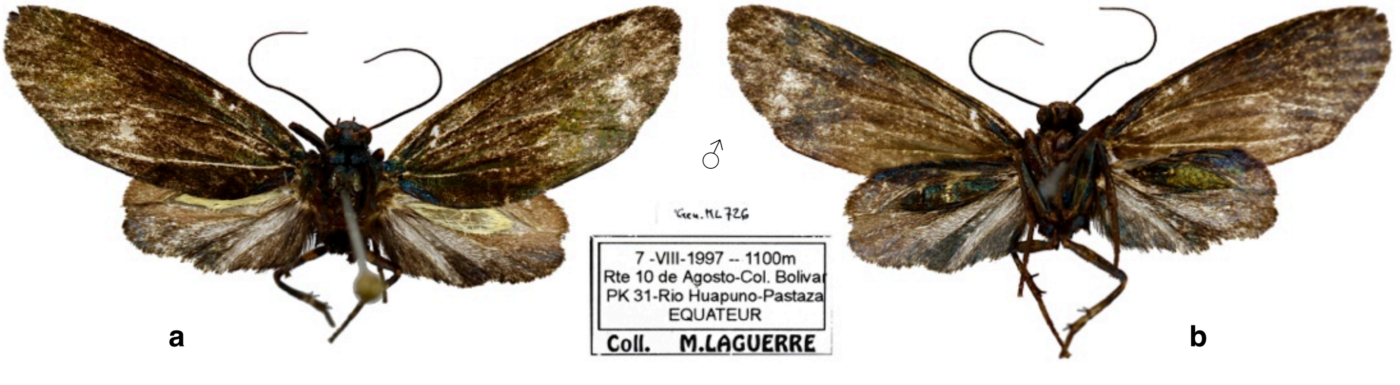

Fig. **26**. *Cloesia* sp., ♂ from easter Ecuador. **a**. Dorsal view. **b**. Ventral view.

The surprise of this study was to find almost all Central America species in a single BIN within 0.8 % maximum distance despite different male genitalia. The differences in external appearance and male genitalia clearly demonstrate that these entities are full species, even if the interspecies distance is largely less than the usual threshold (2 %). In fact barcode is only one third of a gene coding for the sub-unit I of the mitochondrial respiratory complex, which generally contains more than 40 sub-units depending of the host organism. Moreover, due to the redundancy of the genetic code, the majority of the mutations are in fact silent mutations and finally the decoded protein is very often left unchanged despite several gene mutations (2 % represents 13 mutations for a 658 bp gene). So, it is not surprising to find at a short distance several different but close species which inhabit the same biogeographical area. Even if the BIN's constitute an invaluable tool to distinguish between species, this tool has some limits which must not be forgotten and it cannot be used automatically but only after a careful study.

Acknowledgements

The authors thank Paul Hebert (CCDB, Guelph, Canada) for access to the BOLD project and providing very efficient, competent and quick DNA barcoding, and Rodolphe Rougerie (MNHN, Paris) for his help and technical and scientific support in editing and compiling the hundreds of various sequences involved in the ARCT projects.

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To Marcelo Duarte of the MZSP, responsible for the Brazilian expedition which led to the discovery of *C. aereus* **sp**. **n**. The collection permit for this expedition was provided by the Brazilian Ministry of the Environment and the Chico Mendés Institute for Biodiversity Conservation (process number 22205-06).

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Rodolphe Rougerie (MNHN, Paris) is thanked for allowing access to the data collected in the CIRAD Research Station in Paracou, French Guiana.

Finally, all Área de Conservación Guanacaste specimens (those with yy-SRNP-nnnnn voucher codes) were collected, exported and DNA barcoded under Costa Rican government permits issued to BioAlfa (Janzen and Hallwachs 2019) (R-054-2022-OT-CONAGEBIO; R-019-2019-CONAGEBIO; National Published Decree #41767), JICA-SAPI #0328497 (2014) and DHJ and WH (ACG-PI-036-2013; R-SINAC-ACG-PI-061-2021; Resolución Nº001-2004 SINAC; PI-028-2021).

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Project initiator. – ML
Scientific coordinator. – ML
Publisher Correspondence. – ML
Writing the article. – ML, BE, DJ & WH
Article proofreading. – ML & BE
Bibliographic work. – ML, BE, DJ & WH
Material study. – ML & BE
Author of the figures. – ML & BE

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Résumé

Laguerre M., Espinoza B.A., Janzen D.H. & Hallwachs W., 2023. – Révision du genre *Cloesia* Hampson, 1900 : description de cinq nouvelles espèces et recombinaison de deux espèces (Noctuoidea Erebidae Arctiinae Lithosiini). *Faunitaxys*, 11(47): 1 – 21.

Le genre *Cloesia* Hampson, 1900 qui contenait jusqu'à présent trois espèces différentes est révisé. A côté des espèces historiques qui sont redécrites, deux autres espèces mal classifiées sont transférées dans le genre: *Dipaenae zygaenoides* Toulgoët, 1983 et *Lithoprocris methyalea* Hampson, 1900. Puis trois nouvelles espèces d'Amérique Latine sont ajoutées : *Cloesia aereus* Laguerre **sp**. **n**. du S.E. Brésil, *Cloesia andensis* Laguerre **sp**. **n**. du Pérou et de Bolivie et *Cloesia imitator* Laguerre **sp**. **n**. de Guyane Française. Finalement, deux autres espèces nouvelles sont décrites d'Amérique Centrale : *Cloesia mariamartachavarriae* Espinoza **sp**. **n**. et *Cloesia luzmariaromeroae* Espinoza **sp**. **n**. toutes les deux du Costa Rica. Toutes les espèces, leur genitalia mâles et la majorité des genitalia femelles sont illustrés. Un arbre des distances du gène COI est présenté et discuté.

Mots-clés. – Arctiinae néotropicaux, Lithosiini, code barre gène COI, *Cloesia, Dipaenae*, nouvelle espèce, nouvelle combinaison

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Gouverneur X. & Chemin G., 2023. – Description d’une nouvelle espèce du genre *Erythresthes* Thomson, 1864 du Laos (Coleoptera, Cerambycidae). *Faunitaxys*, 11(41): 1 – 3. https://doi.org/10.57800/faunitaxys-11(41)

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Révision du genre *Cloesia* Hampson, 1900 : description de cinq nouvelles espèces et recombinaison de deux espèces (Noctuoidea Erebidae Arctiinae Lithosiini).

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Illustration de la couverture :

Cloesia indéterminé provenant du Panama, Cerro Jéfé (Linda et Jerry Harrison, The Canopy Family, Panama).

Crédits :

Michel Laguerre: Fig. 1, 2, 5, 6, 7, 10-20, 26.
Bernardo Espinoza: Fig. 3, 4, 8, 9, 21-25.
Linda & **Jerry Harrison** : Couverture.

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